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LOGIC

OR

THE MORPHOLOGY OF KNOWLEDGE

BY

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PREFACE.

THE conception of Logical Science, which has been my guide in the present work, is that of an unprejudiced study of the forms of knowledge in their development, their inter-connection, and their comparative value as embodiments of truth. If an attempt founded on such a conception appears to err by over-ambitiousness, I can only plead that an honest effort in the right direction does not depend for its value solely on its intrinsic success. It is at any rate a heavy wager laid by the author on his judgment of the true aim and future of his science, and may attain results as a suggestion which it misses as an achievement.

In the present centrifugal state of logical research, no undertaking, perhaps, can be entirely valueless which aims at reintroducing some sort of unity into the enquiry. Such an aim is necessarily involved in the idea of a single connected science of logical processes and products. It has therefore been my object to maintain the central identity of judgment and reasoning throughout, and in no case to permit the variety of applications due to diversity of matter to interrupt the connection and subordination demanded by unity of principle. Although in periods of transition logical science has been most effectually advanced by detached discussion, in separate chapters, 'books,' or volumes, of Inductive or experimental method, of equational reasoning, and of the Logic of Chance, yet it seems plain that a time must come when the various cases and species of inference shall fall into their respective places as organic members within the intellectual whole. But when this transformation is effected it is necessary that they should lose something of their interesting peculiarity and novelty; and it is natural, from the difficulty of the task, that they should

lose more of these qualities than is necessary. For this reason, as well as from incompetence in the field of exact science, I claim no discoveries in scientific method or in mathematical reasoning, but shall be content if my attempts to represent them have not many more errors than are either necessary or natural.

There is in England a healthy objection to system-making, and a preference for free criticism, against which I should be sorry to offend. I think however that systematic form is essential to clear exposition and to really effective criticism, and I have not supposed that my work will be considered as a system in any other sense than that thus implied. In particular, I do not hope or even desire that the specific names which I have invented for some kinds of Judgment and argument should come into general use. I have endeavoured in every case to retain the accepted usage of the generic names, which are all that are recognised in ordinary logical discussion, and have only used strange titles for subdivisions which have no accepted place in existing logic, and which merely serve to insist upon certain views of logical evolution.

It is almost superfluous to acknowledge here what I owe to other writers, as the Index bears copious testimony to the amount of my borrowings. In bringing together 'Inductive' and 'Deductive' Logic I have followed more particularly Sigwart and Jevons; in the arrangement and analysis of Judgment-forms and forms of Inference I have gone to a great extent in the track of Lotze, and also of Hegel, to whom, so far as I know, the idea of this organic treatment of Logic is primarily due; and in fundamental theory of judgment as in many details I owe even more, probably, than I have acknowledged, to Mr. Bradley, whose work, 'Principles of Logic,' appears to me no less valuable now than it did three years ago[1]. On one particular point, relating to the simplest process of equation (colour-equation, for example), I am especially indebted to Mr. Spencer's Psychology.

Every student will understand that my obligation to former writers is frequently as great when I diverge from them as when

[1] See the author's 'Knowledge and Reality, a Criticism of Mr. Bradley's "Principles of Logic."' Kegan Paul, Trench & Co. 1885.

I assent to their opinion. As I have often been led to express disagreement with Lotze, portions of whose views certainly appear to me strange in so eminent a philosopher, I ought to say that but for his great work on Logic the larger part of what I have written would never have come into my head. I may also express my strong conviction that the reform of Logic *in this country* dates from the work of Stuart Mill, whose genius placed him, in spite of all philosophical short-comings, on the right side as against the degenerate representatives of Aristotle. A glance at the Index will suffice to show how constantly I have referred to his treatise.

I may venture, finally, to discharge an obligation of older standing, and at the same time to emphasise the guiding idea of my work, by observing that the first germ of unprejudiced interest in the forms of knowledge was implanted in my mind, when wholly innocent of Hegel or Lotze, by some remarks made in a course of Logic lectures which I had the good fortune to hear about twenty years ago, the lecturer being Mr. Alfred Robinson, of New College, Oxford. A comparison, which he threw out, between the study and analysis of judgment-forms and the study and analysis of the forms of flowers or plants has never left me since, and I have never seemed to myself able to exhaust its suggestiveness. If I have at all reproduced for others the spectacle of continuity and unity in the intellectual life, combined with the most varied and precise adaptation of its fundamentally identical function to manifold conditions and purposes, which this comparison never fails to present to my own mind, I shall so far have succeeded in the object of my work.

BERNARD BOSANQUET.

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INTRODUCTION.

'If it is held a valuable achievement to have discovered sixty and odd species of parrot, a hundred and thirty-seven species of veronica, and so forth, it should surely be held a far more valuable achievement to discover the forms of reason; is not a figure of the syllogism something infinitely higher than a species of parrot or of veronica?'—HEGEL, *Wissenschaft der Logik*, p. 139.

'We have seen that the members of the same class, independently of their habits of life, resemble each other in the general plan of their organisation. This resemblance is often expressed by the term "unity of type"; or by saying that the several parts and organs in the different species of the class are homologous. The whole subject is included under the general term of morphology. This is one of the most interesting departments of natural history, and may almost be said to be its very soul.'—DARWIN, *Origin of Species*, p. 382.

1. IN giving to the present work the title of 'Morphology of Knowledge' I intended to indicate as its purpose the unprejudiced study of judgment and inference, throughout the varied forms in which their evolution may be traced and their relationships determined. Mere classification, therefore, or mere enumeration of the species of judgment or of inference, would not achieve the aim which I have set before myself, although I am wholly of Hegel's mind when he says that the species of syllogisms are at least as well worth discovering as those of parrots or of veronicas. The two quotations which stand at the head of this Introduction may together exhibit my conception of a logical system, if interpreted to mean that I would treat the forms of judgment and of inference as science treats the forms of animals or of plants, not in the spirit of enumerative classification, but in the spirit of morphological analysis. In the conception so determined, however, one further correction must be made. Morphology, as the science of external shape, involves, I understand, an antithesis to physiology as the science of vital function. This contrast belongs to the distinction of outer and inner, of persistent bodily form Title of the Work.

and living productive process, which appears at first sight to prevail in the world of visible and tangible matter. Were we to transfer any such contrast to the scientific treatment of intelligence, we should obviously be forced to identify the morphology of knowledge with the science of language or of grammar, and reserve for the analysis of the vital thinking function some such appellation as that of Mental Physiology. I do not say that such an antithesis would be false, but it would fail to illustrate the point of view on which I am now desirous to insist. In the systematic activity of thought the contrast between bodily shape and vital process is non-existent. Even the evolution of the animal organism might be considered as the development of a function which is a system of functions, and the science of life if thus regarded would unite, as it appears to me, what is valuable in morphology with the essence and spirit of physiology. Of the system of knowledge, at any rate, this is the true account. The form of thought is a living function, and the phases and moments of this function are varieties and elements of the form. Therefore the 'Morphology of Knowledge' must be construed as not excluding the Physiology of Thought. The science of intellectual form includes the science of intellectual life.

Knowledge and its Content. Truth.

2. Knowledge involves the ideas (i) of Truth and (ii) of Meaning. i. How does the analysis of knowledge as a systematic function, or system of functions, explain that relation in which truth appears to consist, between the human intelligence on the one hand and fact or reality on the other? At first sight, even the genetic analysis of a systematic development which we propose to undertake, though a more genuine explanation of that development than any mere summary of types, is powerless to grasp the relation between the system so developed, and an object-matter that lies outside it. To this difficulty there is only one reply. If the object-matter of reality lay genuinely outside the system of

thought, not only our analysis, but thought itself, would be unable to lay hold of reality. For logic, at all events, it is a postulate that 'the truth is the whole.' The forms of thought have the relation which is their truth in their power to constitute a totality; which power, as referred to the individual mind, is its power to understand a totality. The work of intellectually constituting that totality which we call the real world is the work of knowledge. The work of analysing the process of this constitution or determination is the work of logic, which might be described as the self-consciousness of knowledge, or the reflection of knowledge upon itself. Logic has no criterion of truth nor test of reasoning. Truth is individual, and no general principle, no abstract reflection, can be adequate to the content of what is individual. It is indeed impossible to study the growth of knowledge without lighting upon confusions of thought that evoke a warning word. But even a confusion of thought may have a material significance, and therefore contain a material truth, which escapes the logical critic who perforce ignores its individual content. The relation of logic to truth consists in examining the characteristics by which the various phases of the one intellectual function are fitted for their place in the intellectual totality which constitutes knowledge. The truth, the fact, the reality, may be considered, in relation to the human intelligence, as the content of a single persistent and all-embracing judgment, by which every individual intelligence affirms the ideas that form its knowledge to be true of the world which is brought home to it as real by sense-perception.

The real world for every individual is thus emphatically *his* world; an extension and determination of his present perception, which perception is to him not indeed reality as such, but his point of contact with reality as such. Thus in the enquiry which will have to be undertaken as to the logical subject of the judgment, we shall find that the subject, however it may shift, contract, and expand,

is always in the last resort some greater or smaller element of this determinate reality, which the individual has constructed by identifying significant ideas with that world of which he has assurance through his own perceptive experience. In analysing common judgment it is ultimately one to say that *I judge*, and that *the real world for me, my real world, extends itself*, or maintains its organised extension. This is the ultimate connexion by which the distinction of subject and predication is involved in the act of affirmation or enunciation which is the differentia of judgment.

Meaning. ii. To speak of consciousness as a single persistent judgment is at first sight a paradox, in view of the distinction between an idea and the affirmation of an idea. It is not easy to deny that there is a world of ideas or of meanings, which simply consists in that identical reference of symbols by which mutual understanding between rational beings is made possible. A *mere* suggestion, a *mere* question, a *mere* negation, seem all of them to imply that we sometimes *entertain* ideas without affirming them of reality, and therefore without affirming their reference to be a reference to something real or their meaning to be fact. We may be puzzled indeed to say what an idea can mean, or to what it can refer, if it does not mean or refer to something real—to some element in the fabric continuously sustained by the judgment which is our consciousness. On the other hand, it would be shirking a difficulty to neglect the consideration that an idea, while denied of reality, may nevertheless, or even must, possess an identical and so intelligible reference—a symbolic value—for the rational beings who deny it. A reference, it may be argued, must be a reference to something. But it seems as if in this case the something were the fact of reference itself, the rational convention between intelligent beings, or rather the world which has existence, whether for one rational being or for many, merely as contained in and sustained by such intellectual reference.

I only adduce these considerations in order to explain that transitional conception of an objective world or world of meanings, distinct from the real world or world of facts, with which it is impossible wholly to dispense in an account of thought starting from the individual subject. The paradox is that the real world or world of fact thus seems for us to fall within and be included in the objective world or world of meanings, as if all that is fact were meaning, but not every meaning were fact. This results in the contradiction that something is objective, which is not real.

We do not meet this paradox adequately by reminding ourselves that e.g. a negation or a question is a fact in some one's mind, and therefore as a psychical occurrence is a real event, and in that sense falls within reality. In considering an idea as a psychical occurrence we abstract from its meaning, which apparently consists in some identity or persistent unity that extends beyond the isolated occurrence of the idea in time.

The solution of the difficulty appears however to be suggested by the distinction which we have just taken. As the psychical occurrence and objective reference are distinguishable by abstraction only, so objective reference and reference to reality (affirmation) are distinguishable by abstraction only. The world of objective reference and the world of reality are the same world, regarded in the former case as composed of isolated though determined contents, and in the latter case as composed of contents determined by systematic combination in a *single* coherent structure. The former point of view is an abstraction that goes near to be a fiction, for isolated contents *qua* isolated are not determined. But it is possible and usual to consider ideas, by help of abstraction, in respect of those relations which especially determine them, as detached islands or spheres of knowledge, without actually referring them in a thoroughly determinate judgment to a place in the *one* individual system which for each of us is the reality. Ideas thus isolated are what we 'entertain' as significant or symbolic ideas which have meaning

or objective reference, and yet are not affirmed of Reality. Objective reference is the substance of the convention by which rational beings communicate with each other and with themselves, and which, though a consequence of the unity of Reality, can be regarded without being directly identified with that unity. To show that every idea which is *entertained*, as for example *suggested* or *supposed*, must be taken to be *ultimately* affirmed of reality, is the task of those portions of logic which deal with question, suggestion, supposition, and denial. Thus in the discussion of mere or bare denial we shall be forced to the conclusion that where, in an attempted judgment of denial, no positive basis nor positive consequence of the denial is to be discovered,—where, that is, the idea which is verbally *denied* forms no element *in any affirmation of any kind* about Reality, there no judgment can really take place, nor can the idea in question be enunciated as an intelligible idea. The meaning which an idea seems to retain when named in a spurious judgment or unintelligible proposition of this kind depends on its initiation of other acts of thought than the denial in which, *ex hypothesi*, we were to look for its unaffirmed signification. Our treatment of supposition will lead us to the same result. All significant, i.e. all logical, ideas are ultimately elements in a single judgment, the judgment which sustains the ideal structure of the real world.

Thus the world of truth and the world of meaning are not really distinct, and the process which logic investigates is the single process and individual self-determination of the whole which is the truth or reality.

What knowledge are we investigating?

3. It is natural to ask, 'Where and what is this self-determination? Where does it begin? Where does it end? Is it in the individual mind or in the history of the race, or in an arbitrary combination of the two?'

I cannot attach much importance to this question, which might be asked with equal justice, as it appears to me, of every science. A science deals with its object-matter wherever it finds it. The self-determination of the knowing

intelligence as the real world takes place wherever there is knowledge and in as far as there is knowledge. If the question is whether the process as described is necessarily involved in knowledge or is a mere fact like any isolated fact, there can be no answer except that the question is either superfluous or meaningless. Of any particular logical theory, such as that contained in the present work, it is superfluous to ask whether it is in all respects necessary and absolute. Of course it will contain many erroneous and many accidental elements. But to ask whether a true account of the logical process would be necessary and essential, or would contain mere fact or accident, is simply to ask whether a true account may not perhaps be false. All truth is necessary in as far as it is rationally known. And if a scientific analysis were to lead to no truth at all, it would simply lead to nothing. Whether in any particular instance such a nothing may have resulted is a matter for consideration on the merits of the individual case. But in general I must protest that there is no more reason in asking *what* evolution of thought we are studying, than in asking *what* laws of motion are studied by mechanical science. The laws of motion express the characteristics of moving bodies *qua* moving; and the laws of knowledge express the characteristics of knowing subjects *qua* knowing. It is no more necessary to specify in what particular cases you find knowledge, than to specify in what particular cases you find motion. If knowledge has a nature that can be studied—and if not, there is no logic—it can only exist where that nature is realised; and however the progress of the race may have prepared the intellectual inheritance which is devolved upon successive individuals, those individuals can only make it their own by fulfilling the conditions which constitute its nature. I do not deny that the type and content of knowledge must change with the advance of evolution; I only affirm that any such change depends on the modes and degrees in which the general conditions of knowledge are fulfilled in successive

generations, and not in any difference between knowledge in its essential nature, knowledge as developed in the race, and knowledge as a process within the individual intelligence.

The act of Naming.

4. To give a name is for civilised thought the first step in knowledge. It at once depends upon, and in a sense creates, a recognisable arrangement of things, qualities, and relations. Wherever new ground has to be appropriated, whether actually or in metaphor, the first necessity is to find recognisable points, by which, being named, we can observe and communicate our whereabouts.

The value of this first step is only to be estimated by experience, now necessarily exceptional, of the attempt to attain knowledge without it. We do not experience this simply by going where a language is spoken that we do not understand. No doubt, in the long run, lack of communication with our fellows would affect our reasoning power; but we are now looking for an instance in which we ourselves, within our minds, have no names to aid us in distinguishing and recognising things. We find such an instance in our attempts to deal with any new region of knowledge of which we have not mastered the rudiments and in which we have neither books nor teachers to guide us. This is merely individual ignorance; but the great pioneers of knowledge must be in the same predicament when, going beyond established distinctions and taking note of new phenomena, they lay the foundations of a fresh structure of science. Great discoverers are able to add fresh names to language; ordinary men content themselves with learning the meaning of those in common use. The limitations of popular nomenclature form the limitations of popular observation. When we are brought face to face with a scientific classification and the terminology it involves, we are astounded at the blindness in which we had contentedly been living. Every yellow ranunculus we call a buttercup, every myosotis a forget-me-not, every large

white umbellifer a hemlock; not merely as an epithet, but because we really see no difference. So in the history of architecture or of fine art, popular knowledge is confined for the most part to the application of two or three terms which have gained currency. Few people are able to observe without the help of names.

It is true that there is something ludicrous in the tendency of common minds to cling to a name; in the insistance of an inexperienced art-critic on superficial characteristics which happen to be nameable, when he ought to be looking into the special significance of a work of art; in M. Jourdain's delight at the discovery that he conversed in prose, or in the sudden zeal of Strepsiades for the correct employment of the masculine and feminine terminations. Nevertheless, the current censure of verbal knowledge is itself largely founded on ignorance, and actually on the same ignorance which creates the risk and opprobrium of mere verbal knowledge. In the annals of philosophy there is nothing more tragi-comic than Mill's condescending excuse for Plato's discussions about related existence—discussions which laid the permanent foundations of scientific logic; the modern logician showing his superiority to verbal quibbles by an attempt to dissociate existence from attribution based simply and solely on the fact that existence is sometimes expressed by a peculiar kind of attribution. The condemnation of a knowledge which rests in mere words too often means that the word and no more has reached the understanding of the critic. It is probable that we think too little rather than too much of Naming as a first step in knowledge. To give names which endure is with few exceptions the prerogative of genius. The number of terms which we inherit from Plato and Aristotle is among the most striking proofs of the immense advance which they won for the human intellect. These two great minds mapped out the world of knowledge in its essential features much as we have it before us now, and gave to its main divisions the names which they still retain. Or, again,

what a gigantic advance was made by the work of Linnæus, though it now serves as the stock example of an 'artificial' classification! It was the indispensable starting-point for the more profound and rational researches of modern times, and thus if not one of the most arduous, at least one of the most valuable, of scientific achievements.

I spoke of Naming as the first step in knowledge *for civilised thought*. Plato recognised the operation much as we recognise it. And yet there must have been a time when it was not easy thus to isolate a single word from the sentence. Indeed, even now, the single word *is* not really isolated. Except in the instances in a logical text-book, the utterance of a single word always implies a sentence, and usually a judgment. We now print the title of a book or the description of a species of flower, contrary to older custom, without a verb; but none the less they are read off into propositions or judgments. The artificial nature of the supposed concept which is thought to correspond to a name and to be generically other than a judgment is curiously illustrated by the fact that Linnæus was the first to omit the verb in the descriptions of flowers. Such descriptions, though in appearance reduced to logical names, are of course understood as sets of judgments. No doubt however all these habits, including the use of dictionaries, familiarise us at least with the *appearance* of the significant noun in complete isolation from the sentence, and lead us to imagine that in such isolation it is still a fair representative of some individual object or quality (also isolable) in a way in which the complete sentence is not. But I must repeat that under no circumstances does a man in his senses make use of an isolated noun, except to indicate an assertion, wish, or command. A dependent sentence, as its name shows, cannot stand alone; and a name is for grammar in this respect like some form of dependent sentence. If a man were to say 'the sun,' the difference between this and a given proposition like 'the sun is low,' is not that in the first case we have a mere name and in the second a propo-

sition, but that in the second case we have a given proposition, while in the first we are set to make propositions at random. The same is true of any logical noun, i. e. descriptive or appositional sentence—and a noun may, we shall see, be equivalent even to a conditional sentence—such that it can stand as subject or predicate in a proposition. No such sentence is ever used independently; for all thought, if not optative or imperative[1], is categorical.

Thus it would seem that the isolation of the significant name from its context, which is even now more apparent than real, must in very early stages of language have been a wholly unfamiliar process. The history even of proper names shows a tendency to illustrate this; though proper names for human beings would be, one would suppose, among the earliest productions of language. As we go back, we find the 'proper' name less purely distinctive, less 'proper,' and more significant or predicative. The animal names borne by some savages must be significant, though how or of what may be doubtful. The Roman Agnomen and the Athenian Deme name were directly significant, as of course are many modern surnames in their recent origin. The addition of a name of father (also husband or master) in the possessive case was not originally a mere appellation, it was an assertion of ownership[2]. It is well known that among the Romans the gentile name (*nomen*) was the name *par excellence*, as indeed for most purposes the surname is now. It is less well known that the 'fore-name,' which, if any, was individual, was not at all freely chosen to serve as a distinctive sign; it was characteristic of family, and the choice was exceedingly restricted. Among all the Roman patricians only about thirty 'fore-names' were in use, and the 'fore-name' of women was constantly omitted

[1] Whether optative and imperative forms can or should be analysed into categorical propositions is a psychological rather than a logical question.

[2] Mommsen, Römische Forschungen, vol. ii. p. 5. He shows good ground for supposing that the original form was 'Marcus Marci,' used equally of wife, slave or son, and that Marcus Marci filius (no corresponding form was adopted in Greek) was a later modification.

in Cicero's time. It would be interesting to find parallels for some of these features in modern usage; a small number of Christian names no doubt serves to name by far the greater number of individuals in one country, and the selection of Christian names is to a certain extent characteristic of families or of family. But on the whole it is now admitted that the chief purpose of a proper name is to be a name, i. e. a constant sign, and even the surname, although significant in many respects, is not really to be relied on as an indication of family. The law lets a man bear what name he pleases and change it as he pleases, so long as he makes his desire sufficiently well known; in other words, the law accepts no purpose in the name beyond that of mere recognition.

And in the case of the common or significant name the same thing is more evident. Even so highly modernised a language as classical Greek has no unambiguous expression for 'a word,' though 'noun' and 'predicate' or 'verb' were familiar terms to Plato and Aristotle. The latter has to describe a 'word' by the periphrasis, 'the least portion of discourse which is significant when taken by itself.' The Greeks did not separate their words in writing; and in their inscriptions a terminal consonant is affected by the following initial consonant, as it would have been in a compound word. I do not think it is fanciful to refer to these facts in illustration of the closer cohesion of sentences in ancient than in modern speech. The solvent of the sentence is obviously writing. You cannot take to pieces the spoken sentence as you can that which lies written before you. If you ask an uneducated man about some one point in what he told you, he will say it all over again. But this enquiry hardly belongs to logic, though it helps to rouse us out of the analytic abstractions in which we are now at home. I only wished to guard myself against asserting that the conscious selection of an individual object and the appropriation to it of an element of language common to all sentences in which that object is referred to—that this act of Naming comes first in history as it does in modern

science. It appears to me that the descriptive sentence must have furnished the material for a subsequent appropriation of names; and that the appropriation of names by habitual description must have been quite a different process from methodically searching for new 'points d'appui' and fixing their appellations at one blow.

What the act of Naming implies. Logical Significance.

5. The act of Naming implies in the first place 'Logical Significance.' i. A name then is a sign which rouses the mind to a set of activities having an identical element. In the purely artificial case, when a name is spoken in my hearing without any context expressed or implied, such activities may probably take the shape of interrogation or suggestion; i.e. as is commonly supposed (but see sect. 2, above), a review of matters which we might employ in judgments, but do not yet know how to, being unable to attach any of them to our real world. The meaning of the name consists in its power of suggesting and controlling these activities, these judgments completed *or inchoate*. If, to return to the example suggested above, I hear some one say 'The sun,' my first idea is that the speaker is thinking aloud, and that I have caught the fragment of a sentence which he has completed in his mind. But with a view to logical theory we may neglect the speaker's intention (though no theory should forget that it has neglected this feature of the case), and simply consider what the word does for the hearer. It makes him think of something, and in this case of what is called *par excellence* a *thing*: had the word been 'red,' it would have suggested a *quality*; had it been 'parallel,' a *relation*. We have not to do just now with the difference between these three kinds of signification, but only with what signification is as such. In thinking of something without more guidance than a significant name, we find ourselves involuntarily thinking not merely *of* it, but *about* it. And this is inevitable. That which the name signifies *is*, for us at all events, an identical character exhibited by different contexts, or different contexts united by a common character. Any one who has been told, by an old-fashioned

mesmerist, to 'think of nothing but' a copper and zinc disk which is put in his hand, and which he is expected to contemplate for some minutes, must have found (supposing that he attempted to do what he was told) that his thoughts traversed in a series of judgments the various ways in which the thing affected his perceptions, or reacted in the comparisons that suggested themselves[1]. These judgments, if expressed in language as propositions, would all contain the same name, that of the thing which they described. But although connected with different standards of comparison in the different judgments, the thing spoken of in them all is not different things, but the same thing. If you persevere and try to elicit the root and basis of its identity, you may indeed fix more or less arbitrarily upon certain 'essential' attributes, but these attributes represent the thing in different contexts, and are also themselves, as Mill has explained[2], elements of identity between different contexts. You may judge the thing to be round, hard, heavy, flat, cold, and to be on the palm of your hand, and you may define circular form, hardness, weight, etc. as you please; but you will not express either thing or attribute as other than an element of identity which is exhibited and takes shape in different aspects or relations. Mr. Bradley[3] has pointed out that extension in space or duration in time are sufficient to invest that which has them with the character of an identity into which differences enter. This—an identical element which enters into and is entered

[1] I suspect that the particular mesmerist to whom I refer was influenced by the fallacy which has been combated in the text, and imagined that to think continuously of an individual thing involved an immobility of thought, as though the thing were for thought like an image in space fixed and isolated. In attempting to attain such an immobility (which attempt, on this hypothesis, the operator intended to be made) the patient would simply arrest the operation of his intelligence, and would thus approach to that withdrawal of attention from all specific stimuli which is perhaps a condition of the mesmeric sleep. How far this principle is connected with that of Braid's and similar experiments, I am not expert enough to say. Cf. Lotze, Metaphysik, sect. 304.

[2] See Mill's Logic, i. 201 (sixth edition).

[3] See Bradley's Principles of Logic, p. 44.

into by differences—is what we might call the logical significance, the significance which must be postulated in all cases, of a name as such.

The process of Naming, as known to our reflective thought, is to adopt an individual element of language as the instrument of intellectual reference to an individual identity in the knowable world. The conscious adoption or appropriation of the linguistic sign is the same thing in principle, whether the sign is employed solely within my own consciousness, or is applied to communication with other intellectual beings. The 'convention'[1] or agreement which has been said to give language its meaning, would be the same thing between other persons and me that the employment of significant signs is between me, so to speak, and myself. It is as wonderful, and as much a proof of 'convention,' i.e. of the power to agree, that 'goodness' should mean the same to me yesterday and to-day, as that in this sentence it should mean the same to me and to my reader. It may be said, and here we anticipate a difficulty which must be treated later in this chapter, 'But goodness does not mean *quite* the same to you and to your reader, or to you at different times.' Then I will change the phrase and substitute 'refer to.' It will be seen at once that if 'goodness' in my mouth and in yours does not *refer to* the same characteristic, it is not intended to *mean* the same, and its meanings however different cannot be conflicting. In that case the two characteristics referred to are 'homonymous,' and the same word goodness is used for them only by accident[2], as glass is for a telescope and a tumbler. The point and purpose of a name is, always to refer to the same; it is on this reference that the whole possibility of mutual intelligence depends. The connection between isolated reference, or

[1] A name is speech which has meaning according to convention (*κατὰ συνθήκην*). Arist. Περὶ Ἑρμηνείας, sect. 2.

[2] By accident as regards present use; there may be a common history, but this is rather a source of deception than of clearness.

meaning, and reference to a system, or affirmation, has been explained above (sect. 2).

Identical reference or rational convention is thus the root and essence of the system of signs which we call language[1]. The act of Naming, i. e. of establishing such a reference, and of appropriating a sign to it, has been elaborately analysed into a number of processes or aspects. In my opinion such an analysis should be regarded mainly as a *mere* analysis—as a distinction of aspects and not as a history of acts. Historical conclusions may flow from it; but the analysis is the first thing. We are here met by a difficulty which besets all the higher sciences, and which I shall endeavour in the first instance to grapple with in its general form.

Meaning of 'implies.'

ii. The distinction of stages in a continuous growth has always a degree of artificiality. It is hard to say precisely when an embryo becomes a chicken, or a boy a man. It is impossible to say at what point feeling appears in the organic world, or when a child acquires a will, or a primitive tribe the instinct of religion or of fine art. Characteristics which attract general notice only when full-grown, are traceable far back when we come to look for them; and further, they are frequently implied by the nature of an individual long before any scrutiny can detect them. It is a cheap and false accuracy to express such a growth in successive stages according to the definite emergence of obvious features, without scrutinising the continuous identity which is present from beginning to end. But it is a fatal carelessness, on the other hand, to treat rudimentary attributes as *ipso facto* equivalent to their mature form, or as

[1] I can see no ground for restricting the *logical* conception of language to written or spoken words. We must not argue from the possibility of educating the deaf and dumb (cp. Lotze, Logik, sect. 6) that 'the logical operation in the mind is independent of the possibility of linguistic expression.' It is unfortunate that the German 'Sprache' and 'sprachlich' make this inference appear a truism, while if we ask whether the deaf and dumb can in thinking dispense with fixed signs wholly or in part, the question, though still of interest, assumes a very different complexion.

necessarily identical therewith in the features of chief concern. The labour of genuine science is to disentangle the *true* continuity of processes, limiting it only by modifications which are certainly traced or inevitably implied; never assuming the existence of a highly developed attribute or function where it is not seen in operation, or shown to be implied to the exclusion of all conceivable alternatives. In fact, if 'conceivable' means 'conceived up to a certain stage of knowledge,' the last clause is not stringent enough; a suspension of judgment is often preferable to a conclusion from disjunction which violates general analogy. Many complete-looking disjunctions are imperfect; and unless supported on a thoroughgoing principle, a disjunction is worth nothing at all.

It is hard to escape both the complementary blunders which I have indicated, and the object of this digression is to point out that though we may not escape them altogether, their sting is removed if we are not too ready with our disjunctions, but discuss to the best of our power the principles which underlie functions and attributes, and the consequent limits and laws of their modifications. Have such and such savages the instinct of fine art? Probably Yes or No would be no answer. We should find that they had some elements or germ of such a tendency, perhaps the love of imitation, or earlier still, the instinct of construction. Then we should have to estimate the value of this and its connection with aesthetic capacity; and the correctness of our whole reading of the facts would probably depend on the rightness of this estimate. The act of naming presents such a problem. Does Naming, for instance, imply the processes of Comparison and Distinction? Does it imply a Judgment, such as the Judgment of Perception? If we look at the activity of highly reflective thought, we must unhesitatingly answer both questions in the affirmative. It is a serious matter to introduce a new word into language, or to christen a new phenomenon or a new species. All that science can do to verify and determine is being

done when, and is largely done before, such an event occurs. Or if we go to the extension of the individual's knowledge, which is to him a creation of new appellations, the same holds good for kindred reasons. The individual profits by the work which language presupposes, and all sorts of apparatus is at hand by which he can put himself through the processes, in learning a name, which the discoverer went through before him in conferring it. This is the one extreme of the growth we have to watch; the extreme at which the function we are discussing has become an instrument of conscious science.

Objectification.

iii. In speaking of the opposite and lower extreme, we have to depend on analysis and implication. Let us think of the feature of *reference*, which we found to lie at the root of intelligent speech. A name always *refers* to something. (I must repeat that the idiomatic 'something' is not to be taken as meaning an individual '*thing*' in space.) I avoid saying that it refers to an idea in the mind, because, unless the name explicitly proclaims itself the name of an idea, it does *not* refer to an idea in the mind as such[1]. When I use the word 'red' I do not refer to or mean my idea of red considered as my idea, though I do mean red as I understand it by help of my idea. When I use the word, I mean a colour, a quality of surface, or at least of light, which I represent to myself by help of one or more reds which I have seen, but which I think of as not dependent either for being or for quality on my happening to know it. The fact that my perception of red may be abnormal does not affect this reference. As I pointed out above, if it were not for the identical reference there could be no conflict, no question of normal or abnormal. This, then, if no more, is involved in naming. That which is named is recognised as having a significance beyond the infinitesimal moment of the present, and beyond the knowledge of the individual. It enters into the 'convention' which he who uses language maintains with himself and with others. It is, in short,

[1] See below, ch. i. sect. 1.

characterised as an object of knowledge[1]. Under this aspect the act of Naming has been well called the act of Objectification.

Let us further consider what is implied in the act of Naming considered as an act of Objectification.

A positive content.

iv. In the first place, then, the matter which is invested with the attribute of being such as to be known—which is thus 'objectified'—must be something positive, something, so to speak, of affirmative nature[2]. It must be presentable to consciousness by help of some actual modification of consciousness. I mean that it cannot consist simply and solely in the distinction between itself and something else. It is one question how we come to perceive a certain content—contrast and distinction may be essential to perception—another what it has in it when brought into perception. It may be—the question is chiefly psychological—that if red had been the only colour we should never have been aware of it *as* red. But now, being aware of it, we find in it a positive quality or character which is not exhausted by the distinction between it and all other colours. This is the primary condition of the act of naming. That which is to be referred to by a name, which is thus erected into an object for intelligence, must be at least a positive content, something with a nature and character. It is not safe to clinch the matter by saying '*definite* nature,' '*determinate* character;' for though scientific naming involves all this, yet it would be overbold, and would beg a question which we shall soon arrive at, to presuppose all this for every act of naming. 'Definite' and 'Determinate' introduce negation into knowledge, and so are not words to be used lightly. We must if possible keep to one thing at a time, and what we are sure of at this point is this, that the identity in difference which is referred to by a name is something positive; not necessarily a 'quality' in the technical sense of an immediate unrelated matter of perception, but necessarily a something.

[1] Cp. Lotze, Logik, sect. 3.

[2] Cp. Lotze, Logik, sects. 10, 11.

It is obvious that for the general purposes of logic such meaning is not confined to substantive and adjective nouns or names. A positive content is also referred to by the material or uninflected element in verbs, if we may for logical purposes distinguish this from the formal or inflected portion, which indicates the connection and function of the verb as such. When I say 'it flows,' of course in the element 'flow' I use a significant sign which refers to a positive content. Very probably as we go back into primitive speech the distinction between this and the grammatical Name would disappear. Aristotle certainly treats 'is white' as a verb [1].

Meaning of verb- and case-endings.

v. Here we cannot escape raising a further question. Granting that pronouns used independently rank as nouns, still there remain inflected elements of verbs, the case-endings of nouns, adverbs, prepositions and conjunctions. Does not each of these indicate an identity in difference, a positive feature in the world of meanings? Why are not they too to be treated as names? There is no doubt that the words in question are fixed signs which refer to positive features of the world; nor that their contents are such as can have names given them which can be employed in propositions as substantives or adjectives. Presence in time or space, Intention, Direction, Proximity, Property, Attribution, Reference, and the corresponding adjectives, these are all intelligible names and designate familiar matters. Yet they are but another shape of such linguistic elements as 'Here,' 'Now,' 'For,' 'To,' 'At,' 'Of,' 'About,' the *s* in 'flow*s*.'

It would be easy to answer that these elements are signs

[1] He distinctly treats the *ῥῆμα* as capable of indicating time. So his idea of it did not quite cover our Predicate, which he would call *τὸ κατηγορούμενον*, though on the other hand we do not recognise 'is white' as a verb. It is remarkable that he should have insisted on the indication of time in face of the fact (constantly borne out by his own instances) that the verb 'is' could be omitted in Greek, and predication conveyed by position only. It seems therefore that to say the verb was *understood* would have been no empty phrase to him, but would have expressed the fact as he regarded it.

whose content consists in the actual operations of thought; that therefore they are not at first names, because we are operating directly and not reflecting on the operations; but that they become names at the stage of reflection in which we become aware of the part played by our intelligence in connecting and comparing the data of sense-perception.

But this would not be true. There are names for intellectual acts, such as Comparison, Measurement, Enumeration; but these just show the difference between the operations themselves, and the results gained by them. 'Similar,' 'Equal,' '$\frac{1}{10}$ of,' 'Present, 'Near,' are not mere signs of operations performed by the individual intellect. We unhesitatingly treat them as characteristics of matters which we meet with in the objective world. We find them out by combination, comparison and measurement, but we treat them as independent of the acts of our individual mind. 'Present' may create a difficulty, if we think of it solely as present to *us*; but it is obviously a relation predicable and constantly predicated of objects or occurrences with reference to any self-conscious subject. Indeed, all names are signs of thinking operations, so that this would be no distinction between names like 'equal,' 'near,' and names like 'warm,' 'painful.'

But it is true that the inflectional and formative elements in question have this much in common with mere signs of intellectual acts, that we use them in propositions before we make propositions about them; and that when we come to make propositions about them we still have to employ them in one form, in order to make propositions about their other and abstract forms. And further; like signs of intellectual operations, they cannot exist by themselves; they are not intelligible unless put in connection with substantive elements. You might say '"Of" is not "For"' in the sense that a man's legal property is not morally for his sole benefit; but then the related points are supplied in interpreting. The proposition is not intelligible in the same immediate sense in which 'Red is not Green' is intelligible.

Thus the formative elements of language are not complete names on the one hand, nor mere signs of intellectual functions on the other. They are however significant, and significant of matters which are capable of being named. But the matters or characteristics which they signify are such as to presuppose related terms, and to be incapable not merely of being, but of being understood, apart from those terms. We find these meanings or attributes therefore, in the first instance, in explicit dependence on the simpler contents which they imply; and we only find them treated as nameable or isolable contents at a stage of reflection which can supply the presupposed simpler contents in a typical form. Thus their apparently subordinate position in the simpler classes of judgment comes not from their being so little significant, but from their being so much. They indicate, not indeed mere acts of mind, but the realised wholes which arise for knowledge through those acts of mind. Their names are names for such wholes, and for nothing less; as expressive of a special relation within an individual whole they are not names but auxiliaries [1].

It is quite true therefore that the formative elements of language imply acts of mind; but not true that what they indicate are mere acts of the individual mind, such as Judgment or Comparison.

Naming and Distinction.

vi. So far we have spoken of Naming as involving Reference or Objectification, and of Objectification as involving an affirmative or positive content. Are we obliged by these conditions to treat Distinction and Comparison as essential to the act of Naming? When we refused to apply the terms 'definite' and 'determinate' to the positive something which constituted the identity that can be named, we did so in order to avoid begging the question of distinction

[1] 'Here' and 'now' are peculiar. As implying relation to the subject which judges they carry their points of application with them even in their first and direct use, and can be used as logical subjects even in perceptive judgment; while for instance 'at' and 'in' cannot. But 'here' and 'now' generalised into 'Presence' drop the special relation to the judging subject, and indicate a relation to any judging subject.

and comparison. We felt sure however of one thing, that a positive content is what makes distinction possible[1], and cannot itself consist in a mere distinction from something else. I am speaking all through of being as it is for knowledge; not of the ontological, and to my mind, fruitless question, how being can be apart from a consciousness. What I say is, that we cannot see how the characteristic quality of a colour should be supplied by the distinction between it and all other colours. And if the process of distinction does in fact make us notice all the features of something present to perception, this is only because contrast, in this case, invests those features with an interest which they might equally have obtained in some other way.

Mere distinction is not the essence of naming. On the other hand, distinction is implied in the purpose of naming. I do not say that the implication is always apparent. But the least reflection, the least practice in the use of language, must bring it to the surface. We shall constantly have occasion to speak of the interest or purpose which is essential to all judgment. And it meets us here on the threshold of intelligence. Why do we name? Why do we refer to an identity? What do we want with a set of signs? To give voice to our positive wishes and feelings, we may reply. Doubtless, in the first instance. But this very giving voice, this fixing on a something, *is* selection. It answers the question, 'What do you want?' and is meaningless except as an act of choice. If there was only one thing in the world, we should not want a name except to distinguish between having it and not having it; or if we wanted no distinction, we should want no name. And when we use a name, we *ipso facto* select, because we omit; and we omit on a plan and with grounds, because a purpose guides us in selecting.

Therefore I should state the relation between naming and exclusion or distinction, as follows. Reference or Objectification, as represented by Naming, carries Distinc-

[1] Cp. Lotze, Logik, sect. 11.

tion or Exclusion with it *formally*. I do not mean externally or explicitly, but just the reverse. The act of Naming *is* in the abstract an act of selection, though we may not at first find it out. It is therefore selective or exclusive in form, but is not so materially, in any special relation, till we use it for that purpose. And how soon this happens, how soon and how far a material value is actually given to the implied element of exclusion, is a question rather of anthropological psychology than of logic. In the very beginnings of human thought (which I take as equivalent to thought aided by speech) it may be supposed that the sense of distinction would be chiefly represented by the *effort* to identify and fix under a name, and by the feeling of *success* when the desired result was attained by such means. It is clear that such effort or success would represent a rudimentary work of distinction, which combats the difficulty of fixing the content and of finding and adopting the sign. Or if the sign-system grows without perceptible effort on the part of individuals, there is still the interest to which I have alluded. The distinction of man and woman or *meum* and *tuum* must, one would think, invest some contents with negative determination from the very first.

On the other hand, even our reflective thought is perplexed when its attention is first directed to the mutual implication of very familiar facts, which seem to have independent being because so familiar. The essence of objects in space may not be in distinction; we certainly however tend to underrate the importance of distinction in knowing them. And when we come to negations such as those implied in consciousness or morality, for instance mind and matter, sin and the law, the degree in which essence seems to consist in distinction surprises us at first. Distinction then is formally involved in Naming; but the degree in which it is realised *as* distinction between 'this' and a definite other, and as essential to the character of 'this,' is not determined by the mere use of a significant sign. It may not

be so realised at all. And when it is so realised, it involves logical forms which go beyond the Impersonal or other nuncupative Judgment; forms such as negation, disjunction, and classification.

There are indeed facts which are such as to be essentially relative—(*καθ' αὑτά πρός τι*)—a pregnant conception of Aristotle. And obviously all facts partake progressively of this character as they are united with the whole of knowledge, and as, in this process, their centre of gravity, so to speak, is shifted outside them by their connection with larger systems. We can scarcely understand a curve except as distinguished from a straight line; nor sin except as distinguished from a good will. Nor can we know even red light or violet light scientifically without including in the conception of each its wave-length and degree of refrangibility or place in the spectrum—a disjunctive knowledge which involves a number of precise reciprocal distinctions. As thought grasps more of its object, the object takes more of this coherent character. And in an object thus coherent, it may seem that distinction or negation takes the place of affirmative nature. Straight *is* the line which is not curved. Sin *is* the will which is not good. Red *is* the light at the other end of the spectrum from violet. Here we are in the region of the complicated contents described above as relations. Distinction has here a value which it had not before, but it is not mere distinction or mere negation. The distinction is valuable for its positive ground, and the negation for what it affirms. The point is not that the essence of a fact can be given by mere distinction, but that positive matter finds it necessary to take the shape of distinction and negation. I shall return to this subject in treating of negation and disjunction. The distinction from straight is the essence of curve, only because or as far as the positive spatial nature of line and direction is involved in 'straight,' and this same spatial nature is also involved in the opposite curved. It is not really that 'Not straight is curved,' but that 'What-

ever is *a line and* not straight, is curved.' It is the nature of space, as known in line, and in constant and varying direction, that forms the positive content of both determinations.

Thus it is never true *in the plainest sense* that a thing or matter of fact has its essence in mere distinction from another; but it is true, as we shall see more fully, that all reality is so entangled and interwoven, or rather is so coherent in each of its several regions, that in mastering the positive essence of one fact we are forced to master that of many more, all of them being branches of the same stem. Even in the simplest cases there is at least an element of content common to the facts distinguished, like the stem up to the parting of the branches; and every distinction made between them has this at least for its positive content, as in distinguishing red from violet we imply that both are light. But no doubt in more intricate cases, the alternative or alternatives may be essential to their subject; and in that case the metaphor of the tree breaks down, for the nature of the whole is such that one *branch* perhaps cannot be seen, or perhaps cannot exist, apart from the perception or the existence not merely of the stem but of the other branch. Still we must think of the positive nature of the whole revealing itself in this peculiar form (say the nature of a moral being revealing itself in the good and bad will); *mere* distinction or negation is no characteristic at all.

Distinction then is involved in the purpose and essence of naming, but primarily as a *consequence*. Meaning, or the use of names, is never mere distinction; though proper names are used for the sake of mere distinction, and so with no care for positive meaning except as subservient to that end. And though in the deeper grasp of reality Distinction, Exclusion or Negation comes to be an active and prominent property of fact, yet this exclusion depends for its value always on its positive ground or motive, and never, as such, constitutes the essence of anything.

Naming and Comparison.

vii. And what is true of Distinction is true of Comparison, or rather, as I shall use the terms in future, of Identification.

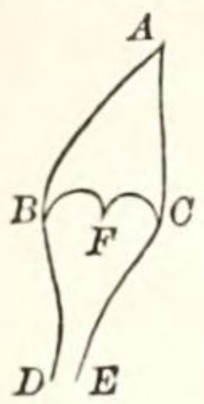
Formally, in the light of analysis, and in respect of purpose and interest, to use or give a name *is* Comparison. For it is identification, the establishment of an identity which holds good in spite of differences. We may illustrate by the German word 'Vergleichung,' which is usually rendered 'comparison,' and which seems to be used in logic (I am not speaking philologically) to mean the establishment of a 'Gleichheit' or immediate identity between the terms compared. This applies—cannot but apply—to the use of names as we have described it. But if we take Comparison at the other extreme of its meaning, which 'Vergleichung' shares with it, we must say that it is a distinct reflective operation, which presupposes naming and is not implied in naming. Comparison *par excellence* is a process which starts from the content of recognised names, and reacts upon it with a view to the interest which may have provoked the operation. Ultimately as a scientific method, it involves measurement, and is the instrument of classification; whereas the use of names must be prior to number or measure, and classification *as a method of science* arises so late that its genesis is almost within our ken [1].

It would be easy to say, in the tone which I deprecated above, that Identification as a method of science presupposes Distinction, and therefore is a process naturally later than Distinction, and not to be looked for concurrently with the latter in the earlier stages of knowledge. But this would be merely a commonplace blunder. It would be as easy to show that Distinction presupposes Identification, as that Identification presupposes Distinction. Before you can distinguish colours as red and green, you must identify them as coloured surfaces; and before you can identify the surfaces in respect of colour, you must distinguish them as separate areas in space. We can come to no good result in this way. We are merely pointing out, not any special

[1] In Western thought, it was probably first analysed and its import pointed out by Plato. In practical life it must have arisen in the earliest society by the effect of social rules; see above on distinction. Exogamy is an instance of an early custom which operates through classification.

relation between Distinction and Identification, but that every level of reflective observation presupposes a previous level on which it improves. How do we begin then? It may be hard to say how matters get into consciousness, but all that is in consciousness seems to present both difference and identity. And we shall find how closely they are connected, and reveal the true relation of Distinction and Identification in the germ of knowledge—the act of Naming—if we look closer at the nature of Comparison itself, taking this as a process which may end either in Distinction or in Identification.

If, in order to effect a comparison, we trace two shapes, say the shapes of two leaves, one upon the other, it is clear that we shall have a repetition at every minutest step of what takes place in the act of naming. Coincidence, deviation—curve and straight—jagged or uncut—notched or entire; the discrimination of universal characters like these, with, if worth while, accurate measurement of differences, will mark the process as it goes on. In respect of each of these points we may infer an identity or a distinction; we express an identity by a single judgment, either 'The outlines coincide' or 'Both outlines are slightly serrate;' a distinction either by the single judgment, 'The outlines are different,' or by the two judgments, 'One outline is serrate and the other simple.' We should notice that if any portions of the two outlines absolutely coincide, we



can only predicate identity of them within that portion by bearing in mind the ideal continuity of that bit of line E C with the two differing outlines E C F and E C A. If we leave this out of account, judgment and identity disappear. Hence it seems to follow that complete comparison must always resolve the terms compared, in the respect in which they are compared, into cases under a universal, or differences within an identity. Identity without difference, or difference without identity, destroy the meaning of comparison. It is for this reason that the single judgment will

not contain a complete comparison. We shall see that a disjunctive form is really required. But it is true that the conclusion in these processes moulds its result into apparent opposition to its starting-point, or rather, causes us to read into the starting-point the complementary aspect to that which is proclaimed in the result. This is simply because the result is a modified form of one element in the starting-point; of the identity if it is an Identification, of the difference if it is a Distinction. The complementary element is thrown into relief by the explicit exhibition of the new determination, so that Difference always seems to be predicated of Identity, and Identity of Difference. But really the judgment has done nothing more than to develope further either the identity or the difference of the datum. 'X and Z are like;' here we take X and Z as distinct objects, though we know well enough that if they *are* like, they *were* comparable. 'X and Z are different;' here we take X and Z as instances of some class or rule and so far identical, though we know that if they *are* different they *were* distinguishable. '"Sorrow" and "Sorry" have quite different etymologies.' '"Sorrow" and "Sorry" have the same meaning.' The former proposition assumes sameness of meaning, in spite of which it asserts difference of etymology; the latter starts from a difference of form, perhaps intensified by a difference of etymology, in spite of which it asserts identity of meaning. And yet the former also treats the words *as two*, and the latter as *prima facie* the same in their significant part.

I do not think that distinction can be effected except by developing differences which are presented, or identification except by developing an existing identity. But of course either element may be very faint at first. It is of no use to say that we may be artificially set to search for distinctions. No motive will help us in science unless it guides us; and if it guides us to a distinction, then it contains the distinction in germ. The same is true in searching for identities. Thus it would be hopeless to distinguish the two sodium lines in the spectrum while they look single as a small instrument shows

them. And we could never distinguish Ricardian rent from common farmer's rent (e.g. including interest of capital) except by pressing home the differences which are given with, and in, the two kinds of cases. This, like many considerations in logic, will help us to understand the childishly tardy progress of early intelligence, and the cumulative rapidity with which knowledge generates knowledge.

Naming then implies some degree of Distinction and Identification. These two processes might, as we have seen, conveniently be included under Comparison. But Comparison, Identification, and Distinction, as involved in naming, are not the developed methods of which I have spoken[1]. In developed knowledge their *organa* are measurement and counting, in which it becomes mere pedantry to separate Identification from Distinction[2]. I shall return to this point in speaking of the value of Judgments, and shall there treat the earliest distinct judgment of Comparison as the transition to number and measurement. But the key-word of *mere* naming is *Recognition*; and this is the limiting purpose of all functions *qua* subservient to naming. And as regards the affinity between Distinction and Identification, they are obviously two sides of the same process, and it is idle to ask which came first. So far as we can see, Consciousness, or at least Intelligence, must begin with both.

Concept and Judgment.

6. Enough has already been said to make clear my general view of the growth of logical functions. While I would spare no pains to ascertain the precise order *in* which and differentia *with* which logical activities make their appearance, I have never been able to doubt that the central function of the intellect, I would even say of consciousness, is one from beginning to end[3]. In speaking, therefore, of

[1] See further Bk. II. ch. i. on 'Immediate Inferences.'

[2] I mean that it is pedantic to restrict measurable identity to the case of absolute equality, but that if you do not, you must admit a degree of distinction to be present in all cases. A distance of 400 miles and another of 400 miles 1 yard are as we say 'the same to a yard'; and this is the true way of putting it.

[3] Cp. Bradley, Principles of Logic, p. 455 ff. Mr. Bradley's views on this question have influenced mine, but rather in the way of moderating than of suggesting or intensifying the view adopted in the text.

the connection between impressions and ideas, and again between ideas or concepts and the judgment, I am obliged to reject the easy partition into distinct operations which finds place in many text-books. More especially, I cannot at all follow Lotze in his treatment of this connection, and I select his work, as probably the most permanent in value of those which adopt these views, to comment upon when comment is necessary.

As I read Professor Lotze, the act of Naming coincides with that shaping or moulding of an impression which is required to convert it into an idea, as a stone requires shaping to make it fit for use in a building. And then, subsequently, the ideas so shaped are fitted together, and the result, I suppose, is a concept; while it is not till the simpler concepts come to be combined that the judgment takes its rise. Ideas, it will be observed, are thus subsequent to impressions, concepts to ideas, and the judgment is subsequent to the simpler concept.

It is worth while to notice the nature of the analysis by which this account is defended. Impressions must be shaped like stones before they can be fitted together[1]. Judgments must presuppose at least simple concepts[2], because judgments consist of concepts, and if such concepts presuppose judgments, where are the concepts to come from which make up these latter judgments? It is hard to think that such arguments as these really expressed Lotze's mind; they must rather have resulted from over-eagerness to present a perfectly clear arrangement to his readers. The thought of a germ which unfolds differences, of the elementary sensation as already containing, in the features which make it a state of consciousness, rudimentary distinctions which are shadowy at first but receive form and fixity by degrees,—such conceptions seem at once to destroy the application of arguments drawn from mechanical processes. If metaphors are indispensable, we should rather call to mind such processes as the formation of

[1] Lotze, Logik, sect. 1.

[2] Ibid. sect. 8.

structure in an embryo, as the separation of a double star by successively higher powers of the telescope, or indeed as the discernment of features in a distant landscape which prolonged attention even without optical assistance has the power to effect.

And, though the suggestion is hazardous, I cannot but think that Lotze allowed himself to confuse change as process in time with the rectification of error in knowledge[1]. There is nothing whatever in the concept or idea, as Plato thought of it, to interfere with its expressing the laws of process in time. The constitutive equations of curves, read in connection with the law of gravity, have, so far as we can see, precisely fulfilled one of the grandest aspirations embodied in Plato's view of science, the establishment of the true laws of motion as they are in general, and not solely or specially for the heavenly bodies[2]. And these equations are the instance which Lotze gives of the highest order *of concept*[3]. Such a concept or idea embodies the very essence of process in time, or change. It is true that change is also a principal vehicle of indications that our concepts are erroneous, and therefore often requires them to be changed, but this is not because the concepts are concepts, but because they are wrong. It is wholly an illusion, founded I presume on the doubtful idea that predication involves reference to time, or even that the judgment is a transition in time, to suppose that the judgment as such can represent change or 'Becoming,' while the concept cannot. To make this in the least probable it would be indispensable to confine the judgment to narrative judgments which use tense, and thereby to abandon all scientific knowledge.

I cannot but think that the reasons alleged by Lotze for the transition from Concept to Judgment are wholly visionary; and merely conceal the unreality of the entire arrangement which made such a transition necessary. There is

[1] Lotze, Logik, sect. 34.

[2] Plat. Republic, 530–1.

[3] Lotze, Logik, sect. 117.

truth, indeed, in the remark that the judgment reconstitutes the concept *with a reason*; but is there any possibility that the act which reconstitutes the concept is fundamentally other than that which constituted it at first?

I will summarise the criticism which I think essential on the whole point of view indicated by the ordinary succes-sive arrangement, and especially by Lotze's form of it.

If a Sensation or elementary Perception is in Consciousness (and if not we have nothing to do with it in logic) it already bears the form of thinking. I will not say that it is a rudimentary judgment; but it is certainly an act, for it is a change within a percipient subject; it has identity in itself, or it could be nothing for consciousness, and difference, or it could not have identity; and it stands out against other elements of the momentary consciousness in a way that approaches to an attribution. An Impression or sensuous idea becomes a logical idea when it is fixed and referred;—fixed and referred if we like to say so by receiving a name, though this is rather a sign of the act than the act itself. We have here the explicit form of judgment given to what before must have been a mere actual extension of sensations by idea, depending on a general identity, but not consciously referred to an identity other than the psychical image.

Judgment is not, in relation either to impressions, ideas or concepts, a mechanical combination of parts which remain outside each other. It is an expression—perhaps at bottom the only expression—of the unity in which consciousness consists. I do not mean that it is nothing more than an idea or impression; but I incline to think that it is better described as an idea or impression writ large than as a combination in which ideas or impressions are units. Judgments may contain complex ideas, but every Judgment *qua* Judgment exhibits the content of a single idea. Ideas and Impressions, as I have tried to show above, are not found lying apart as words lie on a page, although, by a reflective abstraction, we can regard them as so lying

apart, and when thus regarded they form the world of meanings or of objective references—the identities symbolised by logical ideas.

We have then Judgment or some analogous operation of Consciousness, from the first [1]; and in naming and all subsequent operations we certainly have Judgment. What we are watching all along is the development of an act, a function.

Thus Judgment and Idea go *pari passu*. An Idea is not presupposed by Judgment any more than *vice versa*. And it is, as I have explained, an extraordinary confusion to account for the advance from concept to judgment by the inability of the concept to represent change.

And indeed the whole question of advance from concept to judgment is meaningless to me, for I think of the concept as existing only in the act of judgment. I have tried above to explain the deception which language practises on us in this respect. The question is not easy, and is all-important. I shall therefore return to it for a moment.

If a man were to say in our presence 'The Sun' and no more, we should either suppose that he meant 'The Sun is visible,' or, if circumstances excluded this interpretation and furnished no other, we should turn upon him sharply and ask, 'Well, what about it?' This implies that the words have conveyed a meaning to us, but that the meaning is incomplete. I will speak of the second point first. It may be said that our impatience of the incompleteness of the thought is ethical and not logical; that it arises from annoyance at the waste of an intellectual effort, or at the interruption of other thoughts, seeing that nothing is to result from it; and not from any inability to think the thing 'sun' by help of our idea of it, without judging.

This explanation would have much truth, and only needs pushing further. We *should* in such a case miss the ethical purpose which all thought implies. But this defect would have a logical side, which would be this; that we

[1] Cp. Bradley, p. 455 ff. And see below, Book II. chap. i, on the lower limit of Inference.

should be started upon an intellectual exercise not only objectless, but also and for that reason endless. Thus the meaning is incomplete because undetermined. We are left to traverse an indefinite series of judgments.

And yet (I return to the first point) a meaning has been conveyed. In what shape does it exist? The natural answer would be that an incomplete meaning must exist in the shape of questions or suggestions—of tentative judgments. But a tentative judgment lacks, it would seem, the differentia of a judgment. It does not assert, it does not claim truth. Therefore we have *prima facie* in the idea or conception something that will not go into the form of the judgment. An idea in this stage seems to be in a position corresponding to that of a relative or dependent clause or clauses without a principal clause; a form of language which certainly can exist, but which has not an independent right to existence. Or it may be taken as corresponding to a question. 'The sun, around which the planets revolve, which is hot and bright;' 'The battle—lost or won?' These instances give different cases. In the former the attributes are all constant, and we might if we chose say that we first judge, affirm certain attributes of a thing, and only leave it undecided what attribute is in question here. If this was so, we should have something like a disjunctive judgment. In the latter case, that of the question, the form of sentence is considered absolutely to exclude a judgment, although we have assumed the material for a disjunction to be furnished by the prevalent interest of the moment. What is the thought corresponding to a question? I do not find any sufficient discussion of this subject in the logic books[1]. *Is* a question a peculiar act of thought at all, putting language aside? The test for this is to see whether we can genuinely ask ourselves a

[1] Cp. Bradley, Principles of Logic, pp. 13–14. His treatment is definite though brief, and I cannot agree with it. I cannot think it possible that the *content* of a doubt or negation should be the same as that of the corresponding affirmation. Cf. Sigwart on the Question, Logik, i. 191.

question, or whether it is, like a lie, only a form of speech which has the object of producing a certain effect on others. I am disposed to doubt whether we can interrogate ourselves. It appears to me that a question directed to oneself for information which one has is always rhetorical, is a concise summary of the interest which the information has for us. But we too often have to ask ourselves questions which we cannot answer, and know that we cannot answer. I do not see how these, again, can be genuine questions. While in the former case we know the answer already, in the latter we know that there is at present no answer possible. A question addressed to another person in such a case, i. e. knowing that he cannot now answer, has not the differentia of a question; it is a mere guide to him as to the information which we wish to possess, a memorandum for future use when he may have the information. But, if we are speaking with ourselves, this leads to the former ground of rejection; the question becomes, as before, merely rhetorical. And thus there is not even a prospect of genuine self-questioning; to treat oneself as another may react powerfully on the imagination, but is impossible in strict thought.

Thus a question cannot be an act of thought as such, just as a lie is not, and for the same reason, that it is not an attitude that the intellect can maintain within itself. A question is not merely doubt; nor merely doubt plus the knowledge that the doubt can be resolved in a particular way. It is a demand for information; its essence is to be addressed to a moral agent, not ourselves, in whom it may produce action. It is closely analogous to the imperative, which also cannot be addressed to ourselves except by mere metaphor. Thus to say that the mere mention of a name leaves us questioning or fills us with questions, is not to say what it does for thought.

I suppose that the thought, on which a question is based, must always partake of the nature of disjunction. Where the interest lies wholly on one side of the alternative this is

hardly noticeable, 'Are you going to see Hamlet?' We scarcely think of the possible negation as an *alternative* at all, but rather as a bare nothingness, a rejection of the idea proposed in the question. A more difficult case is 'How much did you give for that horse?' In this case, as in asking 'Where' or 'When?' we assign the general principle of the Disjunction under which the answer is to fall, instead of selecting an alternative and demanding information about *it*.

I should therefore be inclined to think that when a man says 'The battle'—and then stops, and we ask 'Lost or won?' our thought is really a disjunctive judgment with reference to which we express a desire for an action *ab extra* that will enable us to accept one of the alternatives. The same result follows if we describe an act of thought as doubting. It is impossible to doubt without knowledge, and a definite doubt, apart from a moral or religious sense of the term (for a degree of failure of will may pass for doubt in these spheres) is unquestionably a disjunctive judgment.

And if now we return to the case of the sun and its constant attributes, we may find that a similar account is possible. The speaker has uttered what is the equivalent of a dependent sentence; he sets us judging in distinct affirmations about reality which form our resources for estimating what he can mean (or suppose we judge about his mind, it is no less true that we judge), and the indefinite series of these affirmations may be treated as an imperfect disjunction. It makes no difference whether we conjecture as to his meaning or as to the fact which may underlie it; whether we think 'He either means the sun is just visible, or that it is hot, or —,' etc.; or again, simply, 'Either the sun is just visible or,' etc.

Such judgments are *prima facie* substantive or independent judgments. But if it is our express purpose to regard what has been communicated as nearly as we can in the light of a mere idea, mere concept, or mere possibility, then we must be taken to affirm the universal meaning which

pervades these judgments to be true of Reality under specific but unknown conditions, a mode of affirmation which we shall find to be the essence of the problematic judgment. Such a point of view as this is rendered inevitable, in the case supposed, by the absence *ex hypothesi* of any ground for restricting our affirmation to any special element of the universal content, unless, as in the example of the question about a battle, a determinate or partly determinate disjunction is provided by the context. A mere idea then as distinguished from a judgment, but considered as the mere meaning of a name or as an objective reference in the world of meanings—an isolated idea—is the content of a reflective problematic judgment, and is referred to reality as true under unknown conditions or among unknown alternatives. But every idea has its existence in the medium of judgment.

The judgments which embody ideas may have many degrees of unity. The identity which pervades a set of judgments may be quality, thing, or complex attribute. When the identity is a quality the judgments in which it appears are but slightly connected, and one member of the group will not necessarily be accompanied, opposed, or conditioned by any of the others. In the case of groups of not very coherent attributes, such as form concrete things in space, the result is exceedingly curious, and it is very doubtful whether the judgments into which the thing enters should be treated as single rather than as multiple. For the judgment which is made is often related to the others which the identity binds to it, *not* as consequent to conditions or grounds, nor as conclusion to premisses, but as if joined with them either by a copulative or even by an adversative conjunction. 'The strongest men were afraid of him,' i. e. The strongest men, though much stronger than him, yet were afraid. Or, The strongest men were very much stronger than him; and yet, etc. Or, again, The Venus of Milo is in the Louvre; in this any number of judgments may be supplied out of the subject, and linked

by a mere 'and' to the one given. There are all degrees of conjunction; it is well known that even 'and' may carry either adversative or inferential meaning. But where it carries pure conjunctive or pure adversative meaning, there must be a question how far the proposition represents a single judgment. It is from this ambiguity that the judgment is freed by assuming the hypothetical form.

To analyse these degrees of unity here, under the head of the concept, would be superfluous. The whole work of logic is to depict them in the order of judgment and inference.

It should be mentioned that there is unquestionably a reaction of judgment on the actual image or appearance presented to perception. No doubt, *all* arrangement in space has been *learnt*, but I take it that the disposition of points on surfaces perpendicular to the axis of the eye, even if a result of interpretation applied to feelings of motion, is when once learnt an inevitable process, for every detail of which there is a special distinct sense-stimulus. On the other hand, in the perception of depth it appears to me that we have a generically different case. The interpretation of certain dispositions of colour, and of certain feelings in the ocular muscles, to mean 'if I want to touch that point, I must put my arm out as far as I can'—this would cause me no surprise, and would simply be knowledge brought to bear on perception, just as it is when certain appearances indicate that one has food or poison before one. What is noticeable in the case I now speak of, is that the interpretation reacts on the image, that we *seem* to *see* depth exactly as we see height and breadth; and that, in learning to draw, the counteraction of this interpretation, and the reduction of objects to their places on a plane surface is a matter of extreme difficulty. The solid images in which a mere interpretation is thus made visible as a fact, do realise the popular notion of what I might call a petrified concept, a group of attributes and relations which stands still to be looked at. Ultimately, however,

even this petrified concept is a judgment—a perceptive synthesis.

I will recapitulate our results so far :—

i. Naming, or the appropriation of fixed signs for meanings, always marks a first step in the thought which acts so ; scientific naming e. g. marks a first step in a region of science, though a late stage in the history of the human mind.

ii. The formative elements of language are significant, but *qua* formative elements are not names, because their meaning is incomplete without that of other elements. At a later stage of reflection names are assigned to their entire significance, that is, to the classes of complex wholes which they imply.

iii. A name has meaning only in a sentence or by suggesting a sentence. The sentence is the significant unit of language. This is most easily seen in ancient speech, but is equally true of modern and analytic tongues. Dependent or appositional sentences can enter into names. It is probable that the thought corresponding to a sentence is always assertory.

iv. Naming involves Objectification—the treatment of that which receives a name as an object of knowledge, as recognisable, that is, in a world which exists for all thought as such, and is not dependent on the thinking of the *individual* mind.

v. Objectification involves being as a positive somewhat on the part of that which is to be treated as an object of knowledge, but this does not amount to the exhibition of a 'definite' and 'determinate' nature.

vi. 'Being as a positive somewhat' includes in a formal sense being known by Identification and Distinction, which are the two sides of Comparison. But as processes of real or material import, these methods presuppose number and measurement, and are posterior to fixed names.

vii. That which is named is always an identity in difference, and must disappear if either element is neglected or

removed by abstraction. This is illustrated by the relation of names to sentences.

viii. Every name *refers to* such an Identity treated as an object of knowledge, whether thing, quality, or relation.

ix. The meaning of every name is in what it refers to or is meant to mean; but this is represented to the individual intellect by the significant idea which the name causes it to produce.

x. An idea or concept is not an image, though it may make use of images. It is a habit of judging with reference to a certain identity.

xi. There is no correspondence between Concepts as such and Quiescence, or between Judgments as such and Change. As the fundamental form of Knowledge the Judgment tends to overcome change, and to view phenomena *sub specie aeternitatis*, and is in this respect at one with the Platonic 'forms.'

xii. The grades of unity and complication of ideas and concepts are the same as those of judgments and arguments.

xiii. The relation of the concept as representative of the meaning of a mere name, to the assertory judgment, is illustrated by the relation of the dependent sentence and of the question to the assertory judgment, and depends upon the possibility of making the identity in a group of judgments the content of a relatively reflective judgment.

Logical meaning and the mind.

7. It will be observed that having spoken at first of what I may call the *logical* meaning of names, i. e. of their reference in the general world of thought, I have digressed in the last few pages into discussing the act of judgment by which the individual mind realises that meaning. The purpose of this was to show that the acts set in motion by the name and by the proposition were the same, and therefore the logical function of these forms could not be generically different.

But before further considering the logical meaning, it will be well to say something on the relation between the

universal or logical meaning and the act of the individual mind.

Logical meaning we have treated all along as taken to exist in the world of meanings, the world which is common to thinking beings as such. Not merely London and Mont Blanc, but virtue, redness and pleasure, have their being in this objective world of meanings. And yet the meaning which on the one hand belongs to a world independent of the individual peculiarities of our thought and perception, is on the other *our* meaning. It is dependent on our private experience and our private intellectual endowment in two ways.

First, the psychical 'ideas,' the images which our mind generates from moment to moment and which never recur, are only such as our memory, conjoined with the suggestions present at the moment, will supply. Mr. Bradley has well explained how, as images in our minds, these are not ideas in the logical sense, not significant, not meanings. We *use* these images, make them starting-points of thought, treat them as containing approximations to what we mean; we direct ourselves to omit parts of them, or to note that they require weakening or intensification. We may illustrate this by the way in which we attempt to communicate a qualitative impression; but it is only an illustration, because we cannot employ as an instrument of communication a particular momentary psychical image; it is not transferable, not capable of being reawakened with precision by language in another individual mind, nor in our own. We must employ then an image which is already so far universalised as to be subordinate to a meaning; but which may be diverted from its original meaning and applied to another in a way that *illustrates* the employment of a psychical image. 'Not quite sky blue, but a little darker;' 'Between pleasure and pain;' 'A baritone is in quality something like a tenor, though with points of resemblance to a bass.'

Now though, after this fashion, we can deal freely with

our particular psychical images, and make them do duty in very various contexts, yet there are limits to the modifications which can be effected in them. To take a well-worn instance, we cannot suppose that a man blind from birth can ever make judgments involving the *quality* of colours, although he can obviously learn the mathematical theory of undulation and refraction. But the whole region of particular psychical occurrences, immediate impressions of colour, which are made use of in referring to the recognised colour-system, would simply be absent from his mind. Structure, on the other hand, involves mainly relative conceptions, such as movement and position, in which the nature of the particular images employed is indifferent; or, if we mean the structure of an argument or institution, the notions required are such as condition and consequent, function and purpose. Structure therefore can be reproduced by any intelligence furnished with the chief capacities of an intelligence as such.

But, secondly, ideas, even in the sense of meanings, are on one side individual and peculiar. The intellect, at least the individual mind of which we are now speaking, does not move wholly in the objective world of meanings to which its acts bear reference. In extreme cases Content and Reference are in contradiction; in less extreme cases, in veiled contradiction. 'Oh I see, my dear sir,' said a theological disputant, 'your *God* is my *Devil*.' Both parties had made the same *reference*, viz. to God; neither took what he was speaking about for an idea merely in his mind; but nevertheless, in making the reference, each of them had employed a peculiar and special act of thought, determined by his own intellectual conditions and history. The opponent in the dispute maintains that your reference is inconsistent with your content; that one or the other must be wrong. But the possibility of conflict is gone if the reference of both disputants is not the same, and the retort quoted above is an ironical suggestion of a basis of *agreement* on the score of *different reference*. The

antagonists refer to, or mean to mean, the same thing, but they cannot bring their notions of it into agreement.

If we go lower into mere quality we obtain good illustrations of the line between meaning and psychical idea. It is possible, on certain assumptions which do not concern us here, to compare some of the colour-perceptions of individuals, and it appears that there are various degrees of sensitiveness to red light. Now if we take a case, not of absolute red-blindness, but of over or under-sensitiveness to red light; we see that the eye which is thus abnormal can produce, presumably, all the images which the normal eye can produce, excepting only the very weakest in the one case and the most intense in the other. But these, as we rarely meet with or think of them, we may neglect. Now the mind of a man whose eye is thus abnormal has the same furniture of images as our own, but the meaning in each external reference in which they are used must always be slightly different from ours, though such differences pass undetected in common life. If I speak to him of the red of a Doctor of Divinity's hood, he may indeed represent it to himself by any shade of red which springs to his mind's eye; but he will *mean* a weaker or a more intense colour than I mean. In this case the abnormal condition has not interfered (as in absolute blindness) with the supply of images, but only with the occasions on which they are produced, and therefore with the meaning attached to each external influence, to each red object.

This paradox—that in using names we refer to matters as independent of our individual thinking which in this very reference are only represented to us by an act of our own individual mind, certainly inadequate and possibly contradictory to the reference—this paradox is inevitable if we maintain the ordinary line between the mind and the world. No doubt the reference demands some one correct or at least recognisable element of meaning, or else we should set down the name employed as a mistake, and thus

if the reference contradicts the content, the content must also contradict itself. But this does not alter the fact that what we refer to as independent of our intellectual act exists for us when referring to it wholly in that intellectual act.

An effort of imagination might help us to see the real nature of this paradox. We might try to think that the world, *as known to each of us*, is constructed and sustained by his individual consciousness; and that every other individual also frames for himself, and sustains by the action of his intelligence, the world in which he in particular lives and moves. Of course such a construction is to be taken as a re-construction, a construction by way of knowledge only; but for our present purpose this is indifferent. Thus we might think of the ideas and objects of our private world rather as corresponding to than as from the beginning identical with those which our fellow-men are occupied in constructing each within his own sphere of consciousness. And the same would be true even of the objects and contents within our own world, in as far as an act or effort would be required to maintain them, of the same kind with that which was originally required to construct them. We should know that correspondence implies a degree of identity, but also that every degree from mere correspondence upwards had to be won and justified by intellectual work; the *onus*, so to speak, of establishing it would be thrown on the intellect; and the progressive coincidence of our separate worlds would be the reward of knowledge. The moral of such a view is not a bad one; for it places the solidarity of mankind in the intellectual life.

Thus the paradox of reference would become clearer. We should understand that we refer to a correspondence by means of a content. We should soften down the contradiction of saying that a name to meet which we have and can get nothing but an idea, nevertheless does not stand for that idea but for something else. We should be able

to say that the name stands for those elements in the idea which correspond in all our separate worlds, and in our own world of yesterday and of to-day, considered as so corresponding. Even when we say, taking the most subjective of feelings, 'Pleasure is the accompaniment of activity,' we refer to pleasure as a point in which all separate worlds correspond; which occupies the same relative position in all the worlds which are framed by the consciousness of individuals, or, what is technically the same thing, a constant position in the world framed by our own. But we should not pledge ourselves to any special *degree* of correspondence or of identity resulting from comparison; only to the bare justifiability of the reference. This suggestion may be considered, if the reader chooses, as a mere simile; but even so it may assist him in seeing the true relation between the idea which a name arouses, and the object to which that idea refers. The distinction between objective reference and actual affirmation depends, as we have seen, on the difference between the analytic consideration of a connected group of judgments, and the affirmation of one among them.

Extension and Intension.

8. I now return to some further characteristics of the logical meaning of names, and shall follow Mr. Bradley in using 'idea' for a fixed content or logical meaning, not for the psychical images which pass through the mind and never recur—for the signification, so to speak, of the signal flags, not for the particular flags themselves, whose meaning is not affected if different bits of cloth are used on every occasion.

Inseparable.

Their nature.

i. Intension and Extension are complementary and inseparable. *a.* If an idea *is* the meaning or fixed logical content indicated by a name, how does it come to pass that ideas or names are said to have two kinds of meaning, known as Intension and Extension? The meaning proper, the fixed content, is obviously the Intension of the name or idea, sometimes inadequately defined as the meaning which the name *implies*, in contrast with the Extension considered as the whole range of individual objects or instances to which

the name *applies*. But it is clear, as Mill has well insisted, that the intension is the primary meaning, or, as we have said, *the* meaning. To speak of it as implied or connoted, or as the connotation, seems therefore to be a terminology which Mill's own view should condemn.

But if Intension is the meaning of a name, or is the idea which is this meaning, what is Extension? How can a name mean anything beyond its meaning, or how can an idea, which *is* a meaning, yet *have* a further meaning? The answer is so familiar in practice that it seemed worth while to observe that it is not free from paradox. Extension or Denotation consists of the instances, ideal or actual, in which any content is considered as realised or realisable. That is to say, extension is the aspect of a content as particular, or as an exclusive unit. The plural of a noun substantive affords the simplest illustration. 'Men' form the extension or denotation corresponding to the content intension or comprehension of the name or concept 'man.' But 'a man,' the singular meaning correlative to 'men,' is extensive, just as is the plural itself.

If there are two or more instances of the one content, the distinction between these particulars and the content itself is obvious; if there is only one instance, and still more if there can be only one[1], the relation is obscured. But in every idea the distinction between universal meaning and particular embodiment or exclusive self-identity can be traced, and neither aspect can be lacking in any idea. A name or conception without Intension would be a name without meaning, and therefore, also, without Extension; for it is only the meaning that prescribes the Extension. And a name or conception that should have no Extension would be one that would not apply to any particular thing

[1] Sigwart, vol. i. p. 304, gives as an instance 'The centre of the material universe.' There cannot be two points, of which this content is true, but the meaning is still distinguishable from the particular instance, and is theoretically capable of having further particulars subsumed under it. Of course there may be two such points in succession—the centre may shift.

or case, and therefore could have no Intension; for the attributes which are thought of as embodied in particular cases are what constitute Intension.

Fictitious ideas.

β. This latter conclusion might be objected to on the ground that names of fictitious ideas or vain imaginations, or again nonsensical or self-contradictory expressions, have a sort of meaning, or at least find a place in would-be significant speech, and yet apply to nothing, i.e. have no Extension. 'Nothing' in this objection must mean nothing *actual*, if the objection is to be true in fact; but actual in any determinate sense is a limitation or factor in Intension, and if we introduce it into an imaginary conception we create a contradiction and bring the fictitious idea or name under the head of self-contradictory or nonsensical expressions or conceptions, of which we shall speak directly. But if we do not take nothing to mean nothing *actual*, then the objection is not true in fact, and imaginary ideas, the content of absolute fictions, have their extensions in the instances, particulars, or units, or in the aspect of unity which they naturally imply. Chimeras, four dimensional space, Gulliver's voyage to Lilliput, have all the same complementary aspects of meaning and particularity that are involved in man, horse, or triangle.

Nonsensical expressions.

γ. On the other hand, a *word*—for under this head we can no longer speak of an idea—which is unintelligible whether as a mere unknown noise or as a contradiction in terms with no rhetorical significance, is of course not a name, and cannot enter into the discussion; for it has, strictly speaking, neither intension nor extension, so cannot illustrate the existence of the one apart from the other. Only it must be observed that even as a name or sign for a certain noise[1] the combination of letters has still its dual aspect of universality as an identifiable sound, corresponding to Intension, and particularity as a momentary and unique utterance corresponding to Extension.

Names of attributes.

δ. Another case is that of abstract names of attributes,

[1] See Bradley's Principles of Logic, p. 157.

such as 'whiteness,' 'virtue.' It is quite clear that these abstractions are true of particular instances. The simplest rule is to adopt as extension the meaning of the plural of the noun; thus virtue becomes a generic conception, and has its extension in the virtues, i.e. the kinds of virtue, courage, temperance, etc., and its intension in the generic meaning 'a habit of volition directed to distinctively human ends,' or whatever our definition of virtue may be. Whiteness is not obviously a generic term, but has unquestionably a possible plural either in the sense of kinds of whiteness[1] or in the sense of instances of whiteness. In Latin as in English it is somewhat of a rarity to use the plurals of very abstract abstractions; but yet they are sometimes used; and besides, the difference between singular and plural only illustrates and does not constitute the distinction between Intension and Extension. As in the line quoted from Shelley, *the* singular whose meaning is on all-fours with that of one case among those indicated by the plural is itself a particular, and accentuates the extensional aspect of the idea. I may add that it has been well pointed out[2] that such abstractions are 'doubly adjectival,' for they not only apply to real cases or kinds of the abstraction, 'whites' or 'whitenesses,' but they actually *mean* the abstraction of a concrete thing or subject that *has* the attribute. They imply not merely particular whites, but particular things that are white.

The intension of the simple abstraction 'whiteness' is hard or impossible to state in general terms, if we leave out of account the theory of light, which has not been available for this purpose till a comparatively late date in the history of logic. A parallel difficulty caused Plato to say, at least at one stage of his views, that he could frame no εἶδος of a smell, i.e. he could find no general determinate attributes by which to formulate its definition. Such difficulties are plainly matters of the state of knowledge. A content which is recognisable

[1] Cf. Shelley's line, 'White with the whiteness of what is dead.'

[2] Bradley, Principles of Logic, p. 156.

and identifiable in different contexts always has a meaning and intension. We are about to turn to two extreme cases, that of proper names and that of number, which will illustrate the lowest grade to which the intension of a significant name can be reduced. No attribute, however hard to define, can be so indifferent to intensional meaning as the significance of a strictly *proper* name and the denomination of a number.

Proper Names.

ϵ. Proper names have sometimes been pronounced non-connotative, i. e. without intension; because their meaning is not fixed and generalised. On the other hand, Jevons, rightly rejecting this view, which is absurd because as we have seen intension and extension are inseparable, goes into the other extreme by refusing to distinguish Proper from Singular names, and therefore ascribing to the former a *maximum* of intension. By a proper name I understand primarily a name that merely serves to distinguish a place or person, or, in exceptional cases, a thing. As a rule, a thing which is neither place nor person has not the individual interest independent of fixed content which is the root of the employment of proper names. We name a thing according to its species, its type or function, not with reference to its absolute particularity. Cases like that of a favourite animal, e. g. a horse, to which a proper name is usually given, or even a favourite thing, such as Henry Smith's hammer Samson in 'The Fair Maid of Perth,' are exceptions that prove the rule. We can see that in such cases as these a special interest has come to be attached to the particular individual independently of its specific nature. By a 'singular' name as contrasted with a proper name I mean a name that indicates content as such, but content that is in its nature, or at any rate assuming it to be located in the actual world, unique. Such is the instance given above, 'The centre of the material universe;' or, again, 'The king of England in the year 1832.' There is a certain difficulty in finding instances of these names, unless as in the last case we limit them in time, or as in

'The chief murderer of Caesar' confer uniqueness upon them by relation to a true proper name. When we come to speak of the singular judgment we shall see that there is a good reason for this difficulty. It is *prima facie* impossible for any content into which time does not enter to stand as the subject of a singular judgment. The centre of gravity of the material universe may shift its place and thus become in one aspect plural, though in another it remains unique. No idea can guarantee its own uniqueness, which is only given by reference to a position in the actual sensuous series. Still there is a difference between the singular and the proper name; which I proceed to state as shortly as I can.

Every name has intension and extension. But the extension naturally follows the intension, and the intension attaches to the name, without reserve; that is to say, the name as such has a meaning, and is applied to all objects of which this meaning is true. Now the term 'proper,' which means in this usage 'peculiar' or 'individual,' is in contradiction with the above-mentioned characteristic of significant names, and imposes upon them a function with which the nature of intension is essentially at variance, viz. the recognition of individuals as such, in their particularity, and without *primary* reference to their attributes. Intension thus becomes a means and not an end. A significant general name is used of many objects in the same sense; and a significant singular name is used of one object only, *because there is or can be only one object to which its meaning applies*; but a proper name, though used of many objects, is used of each in a different sense. Its rudiment of general meaning is in such an implication as that John is the name of a man and not of a mountain or a steam-engine; or again, some one of the thousand *different* applications of a proper name may become typical, and so set up a general meaning, which however does not attach to the name in its remaining 999 applications, but only elevates it into a term of ordinary language in respect of one application. I refer

to such cases as 'a Daniel,' 'a Croesus,' 'a Solomon,' 'the Rupert of debate,' etc.

But these are abnormal uses in which the proper name ceases to be proper. The particular Johns, on the other hand, to whom the name John is applied as a proper name, do not form one extension corresponding to a single intension of this name. Each of them forms by himself a separate extension corresponding to a separate and distinct intension of the name John. The men called John are not related to their name as 'men' to 'man' or as 'towns' to 'town,' but as Salviati's glasswork and the Pentateuch to 'Mosaic,' or as a human being, and a cairn in the Lake Country, to 'man.' The subject is not without historical interest, but to pursue it would take us too far from logic. No doubt it might be maintained that in early language Intensional and Extensional meaning must to a great extent have coalesced. Whatever sound was appropriated to a sensible incident would at first, very possibly, attach itself only to the concrete or confused perception as a whole, and it might be long before pointing out the occurrence could be in any way distinguished from saying in what it consisted. Thus it might be said that language must have begun with proper names for everything, and advanced to general names, and only then had to face the problems arising from the necessity of identifying *individuals* by help of symbols whose nature is to be *general*. The problem is now solved to a considerable extent by a peculiar convention as to mode of writing and amount of signification to be expected. We know that to find a town in Ontario called by the name of London justifies no single inference as to points of identity between it and the metropolis of England. We must keep etymology out of the question. A word means what it is used to mean, not what it once meant. The derivation of proper names justifies no inference at all as to their meaning. The Remington typewriters bear the stamp of Ilion. In the same way intensional meaning cannot justly be ascribed to Christian names

or surnames, at least in modern England. There is now no legal monopoly of such names (though there may be of trading designations), and if we are taken in by ascribing intension of birth and breeding to a particular name, it is our own fault. But probably this state of things is modern, and the existence of proper names of persons in the full sense would in that case be modern also. If legal or social rights depended on bearing a particular name, then such a name had as an element of true intension those general relations—patriciate, legitimacy, civic birth—in which the right to bear it and the incidents of bearing it were involved. 'The art of giving names,' it has been said, 'is lost.' It is certain that the purpose of mere recognition, to which all attributes are in their nature indifferent and serve only as a means, tends to destroy the picturesqueness of nomenclature by dissociating it from interest in a general and so significant intension. The close relation between mere extensional meaning and the use of number is nowhere more strikingly illustrated than in the custom of numbering not only houses but streets, as in great American cities. In the proper name there is still the semblance or fiction of a general Intension—the special name-word *seems* indicative of distinct meaning; in the number even this fiction has disappeared, and nothing remains but the place of the particular in an aggregate of particulars, united solely by a common denomination.

Thus the distinction between a proper name and a significant name (whether singular, as God, or general, as 'man') is that in the use of a proper name signification is a means to identification; in the use of a singular or general name signification is predicated for its own sake. 'But the identification of a person or thing *is* signification,' it will be said. This raises the question of the nature of personal or individual identity, which is not in place here; it is enough to point out that mere identification is a very barren kind of signification, since there is hardly a single attribute of actual content as distinguished from mere external relations

that is necessarily conveyed by it. Macaulay after his mind was gone was still Lord Macaulay and his father's son, but what else was he that he had been?

Names with number attached.

ζ. If pure Extension were to be found anywhere, it would be found in a general name or idea determined by number, or of which number is predicated.

An extensional whole is an aggregate of individuals sharing a common nature, but regarded as particulars, i. e. as each identical with itself and external to all the others. This is, as we shall see more fully from the analysis of Enumeration (Book I. ch. 4), the nature also of a numerical whole. The unit of number and the particular of extension are closely allied. Each of them consists in the identity with itself of a concrete thing or discernible particular in spite of differences which it includes. Proper names also depend on this self-identity, but have for their purpose to single it out and mark it apart from the whole universe besides. Number does not seek to single out one such identity *par excellence*, but to formulate the relations which arise between such discrete identities as factors in a sum or aggregate. In the first place then, number, though an attribute and so an element of intension, yet by accentuating the embodiment of a content in units external to one another, demands an extensional rendering of the idea. And in so far as depth of meaning is indifferent when we are thinking of aggregate units and not of connected attributes, so far the *intension* of a concept may be reduced to the *denomination* of a numerical aggregate. But if this remnant of intension, which determines the range of the aggregate, is removed, the thought is destroyed in both its aspects.

And further, in the second place, a numerical determination, although itself an attribute, tends to contradict intension proper, and so force the attribute of extension or particularity into importance. It is obvious that in every concept the intension dictates the extension. And the extension so dictated must as an aggregate of instances be theoretically at least capable of representation by a number,

or if not, it must be in conflict with any and every number. We may omit the consideration of parts of space and parts of time, which seem to constitute a series that theoretically defies enumeration; but no actual content of our real world can be thus infinite, so far as we can understand. The human race itself must, as we are bound to suppose, have a limited career, and the limitation, however far beyond our knowledge, must be immanent in man's nature in its relation to his environment. Thus the intension even of man, colour, gold, or other ordinary general names, must ultimately and theoretically imply a finite numerical aggregate of instances[1].

This number, which in such cases as the above we can never know, could be of no possible interest to us, were it not that it affects the import of any other number by which any such concept may be determined. In other instances the knowledge, which in the above cases seems not worth serious thought, is actually ours, or treated as being ours. Such instances are the three persons of the Trinity, the three sides of a triangle, the ten decemviri, the 670 members of the House of Commons, the five regular solids, the ninety degrees of a right angle. It will be observed that these illustrations display the number in very different relations to the intension. A member of the House of Commons is no less a member if some units are withdrawn from the legal number of 670, as, in consequence of death or resignation, is often, perhaps always, the case. The number in which he is a unit does not directly affect his position, although no doubt, if an immense proportion of seats were to become vacant owing to some extraordinary catastrophe, the House would be unable for a time to act as a House of Commons. The same is the case with the decemviri or the two Roman consuls, for the authority of one member of these boards was

[1] This is, in so far as the instances are true individuals in a known system. Mere 'observations' on the other hand, successive presentations to sense, must always be taken as entering into an infinite series, for no power can tell how often they may recur, nor what constitutes a single one. Nor do they by mere repetition tend to generate a system.

independent of that of the others or other. But if we take the case of twelve English jurymen the matter is altered, for the number is essential, though only made so by specific enactment, and if '*a juror is withdrawn*' the others *ipso facto* lose their powers of trying a case, i. e. cease to be in the full sense jurymen.

And it is possible for the number to enter even more deeply into the essence. Two sides without a third cannot be two sides of a triangle; and an angle of one degree is not, considered in itself, a degree in a right angle. The nature of space as an ideal whole does indeed introduce a difficulty here, for it may be said that a degree can only be understood with reference to the circle, and therefore involves the conception of a right angle; and that *in space*, a figure *is* all that it involves. The objection draws attention to a principle which holds good of all units without exception, viz. that every unit ultimately involves the whole in which it is a unit, but it does not alter the fact that we have no right angle unless we have ninety degrees, while we have a House of Commons (unless Parliament is dissolved) so long at least as it has enough members to form a quorum. In other words, the whole implied in the unit in the one case involves a precise numerical determination, and in the other case does not. And it will be observed that as instances tend to approach the former type, the number ceases to be truly extensional, becoming as we shall see (Book I. ch. 3) a result due to measurement rather than to mere enumeration. The content, that is to say, no longer falls chiefly within each unit of the enumeration, so as to make the number a mere sign of the repetition of embodiments of the content, but in some essential respects is generated by a repetition of the parts and does not exist in each taken alone. Thus, as was said, the character of being a right angle is not present in every degree of angular measurement, nor is the character of being a commonwealth present in every individual person—not, at any rate, in the same sense in which the character of being a man is present in

every person. A name or idea which, while involving a number of identical parts, is not truly predicated of each such part singly, was called in the old logic a collective as contrasted with a general name. Army e. g. is a 'collective' name as regards the individual soldiers in it, but a general name as applied to the English, German, French and other armies. The distinction indicated by the term was not valuable, for it was not explained. But it is obvious that a 'collective' name or concept like 'army' is a halfway house between the mere common nature of units like men, horses, books and the like, in which the enumeration of the particulars repeats the intension in every item of the extension, and wholes like nation, Parliament, triangle, plant, in which the parts are bound together by other relations than that of number, and therefore their number does not form the extension of the whole, so much as an intensional attribute of that whole. Thus the enumeration of Englishmen is not so much the extension of the English nation as it is at the moment an attribute of the English nation to contain such a number of Englishmen. The question is whether the content falls within the unit, or only within the synthesis of units.

But whether mere units in an aggregate or elements in a numerically determinate whole, numerable parts must have a number, which must directly or circuitously depend on intension. And every numerical determination other than that which thus springs from intension has the effect of erecting a mere whole of enumeration which, as regards the intension of the general name, is arbitrary and irrelevant. An exceptional instance will illustrate this. Any two sides of a triangle are together greater than the third side. Here the two sides are not a mere whole of enumeration, and are not irrelevant to the conception of the three sides of a triangle. What is here predicated of them is a result of analysis applied to the triangle with its three sides, and is a consequence of the three-sidedness of the triangle. The three sides might indeed be named as subject in the pro-

position. But if we say 'There were 10,000 men in Hyde Park last Sunday' we have constructed a whole of enumeration *prima facie* irrelevant to the concept man and having an extension that conflicts with the extension of that concept, and therefore with the intension that dictates that extension. In other words, we have depressed the term 'man' into the denomination or designation of the unit employed in counting. The number may if we choose be stated as a predicate, and the limit 'in Hyde Park' taken into the qualification of reality which forms the subject; all that concerns us here is to point out that we are speaking of an aggregate framed *ad hoc* by enumeration, i. e. by taking men one after the other in their particularity up to a limit which does not *prima facie* present itself as implied in their nature. We not merely count men as particulars,—we count particulars if we count the angles of a pentagon,—but we divorce them from their natural intension by excluding the greater portion of the extension which it indicates. It is true then that number, *qua* mere enumeration, is, like the proper name *qua* mere identification, in a large measure antagonistic to intensional meaning.

Alleged inverse ratio of Extension to Intension.

ii. The two cases which have just been discussed are enough to show that not every variation of intension involves a corresponding variation of extension, or *vice versa*. The essence of proper names and of numbers is to mark the same extension or the same amount of extension as persistent through intensions partially at any rate varying. Nevertheless, the demand for a formal rule of inter-dependence between these two obviously connected aspects of concept and of judgment was satisfied in traditional logic by the doctrine that intension varied inversely as extension. This idea was an early development of the Aristotelian definition by genus and species, from which it obviously followed that whereas the generic attributes were contained together with others in the definition of the species, the individuals belonging to the species must be contained together with others among those belonging to the genus. Aristotle

noticed this consequence of his own views, but the false accuracy of the traditional rule was a later development of the forms which he established, when their life was beginning to fail. Recent logicians have more or less completely condemned the doctrine in question; perhaps the latest well-known writer who ascribed to it first-rate import-ance was Professor Jevons. His account excludes one obvious objection, viz. that a multiplication of identical instances cannot affect intension, by a proviso that only *logical* change of extension could affect intension. But this makes the view a truism; if *logical* change of extension means admission into extension of a new *kind* as opposed to a mere multiplication of instances, it is obviously equivalent to *some* change, of whatever kind it may be, in meaning as such or intension. But even so, even accepting this proviso, it remains doubtful whether the doctrine of the inverse relation is important in any sense in which it is true. I am inclined, however, to think that the recent logicians to whom I have alluded, e.g. Sigwart, Wundt, and Bradley, and also to a smaller extent Lotze, err by sheltering themselves under a point of form, and avoiding the question of import. It is true, no doubt, that you may have any arrangement of concepts; but it is hard, in view of our gigantic natural classifications with their unrivalled grasp of reality, to place any other arrangement of concepts on a level in real import with that of genus and species.

I will begin, however, by going briefly through the weak points of the supposed law that the Intension of a concept or name varies inversely as its Extension.

a. The quasi-mathematical phrase 'inversely as' is wrong. It asserts a ratio, and a ratio is a numerical relation. But in the case before us, one side of the matters compared does not lend itself to enumeration at all. The parts of extension may be counted, as we have seen, but it is inept to count the parts of intension. For they are not external to each other, and they form a whole such as cannot be divided into units except by the most arbitrary

The mathematical phrase is wrong.

dilaceration. And if it were so divided, all its parts would vary in value, and there would be no reason to expect that ten of them (i.e. ten attributes) should have twice the amount or value of five. We must constantly bear in mind, e.g. in estimating the false doctrine of analogical inference, that there is absolutely no sense in counting attributes.

It may be added that if we disregard Jevons' proviso the idea of a proportion is upset at once. The multiplication of actual instances can obviously go on without affecting intension, so long as we adhere to the ordinary formal idea of an instance. Whether in strict reality every instance, at least in the organic world, must not constitute an infinitesimal step in evolution and therefore be an infinitesimal approach to a new kind, is a further question. If the fact were so, it would merely have the result for our present purpose that every increase of extension must be treated as the addition of a new kind, and therefore as *ipso facto affecting* intension. It may also be pointed out that the mere existence of proper names as above explained, and of descriptions in Mill's sense, i.e. definitions used as practical guides to application, and to that end substituting some single mark for the whole complex of attributes which forms the intension of a concept, is enough to destroy the idea that the range of a concept's application must be altered as its depth of import is varied.

Concurrent variations of Intension and Extension.

β. But putting aside the mere pedantic form of the rule and the multiplication of identical instances, and taking an increase of extension to involve a modification of kind, the substance of the rule may still be impeached. An increase of extension may even be conjoined with an increase of intension, either by the inclusion in the extension of new instances which present attributes, previously unnoticed, in a striking form, or by the discovery of consequences or implications of the meaning or intension which show that a class of cases, not thought of in that connection before, are essentially sharers in the intension so understood.

Thus, if we consider Rent from the Ricardian point of view as the element of profit that depends upon monopoly, we bring under the conception many species of gain which were never thought of in that light before—say, for instance, the usurious interest which may be demanded for money when concealment is necessary to the borrower and he consequently cannot apply to the open market.

But it will be replied, and I have purposely courted the objection, 'You are not increasing the intension, or at any rate you are diminishing it as well as increasing it; you have stripped off all such attributes as "paid for hire of land, houses," etc., and so of course you can increase the extension of your idea of rent.' This is in a sense true. If new instances are included under a given intension, either they must possess the whole of it, and in that case their inclusion as such does not make any amplification of it necessary,—for as it stands it is at least not incorrect, i.e. they are not new kinds, but mere instances,—or they must, as in the above illustration, bring with them a modification of it which science chooses to adopt, and then, from a purely external and formal point of view, they must 'diminish' the given intension; i.e. they must leave out some element of it. But this only shows how impossible it is to discuss the matter on the basis of counting attributes. The new instances may bring with them determinations far more concrete, penetrating, and constitutive of the reality in hand, than those that had to be omitted. We should then rightly say that the extension and intension had been augmented together[1]. When the conception of 'falling bodies close to the earth's surface' had its extension increased by the inclusion of all material elements belonging

[1] The case in which the addition of attributes modifies the old attributes is the most interesting and the most typical. A content in which the attributes are not known as reciprocally modifying each other does not belong to a high phase of being or of knowledge. If the new instances do not remove any hindrance in the way of accepting the new attributes, but merely lead to our detection of a new attribute as if by chance, it is hardly a fair case of increasing intension, it being so purely our own fault that we were not as wise before.

to the solar system, then no doubt some such restriction as 'at the earth's surface' was stripped off from the intension of falling bodies, but on the other hand a determinate concreteness of detail—the inverse-quadratic ratio of attraction—was added to this intension that made it far more full of significance than before. If we count every attribute for one we may say that the amount of intension in this case remains unchanged, but this would be a ridiculous conclusion. What is *one* attribute?

The complementary proposition to that which began this paragraph does not in its natural sense apply to knowledge. Knowledge does not decrease, but only increases; for the operations of forgetfulness are arbitrary and do not follow the laws of knowledge. I cannot therefore undertake to show that a decrease of extension may involve or be involved in a decrease of intension; except in the sense that a change of classification may leave a name or recognisable idea robbed of much of its import, and also deserted by many of its instances. Thus the word 'Ecclesia,' which originally meant the whole visible church or congregation of believers in any locality, now, in its derivative 'ecclesiastic,' is applied to a sort of civil servants who exist within that body, and thereby has lost as notably in range as in import.

But of course the mere *formal* complementary proposition, that the lesser Intension may be conjoined with the lesser Extension, is only the other reading of the instances which show that the greater Intension may be conjoined with the greater Extension.

Subsumption.

γ. The whole idea that judgment and reasoning naturally or exclusively depend upon subsumption, i. e. upon taking attributes as connected simply within and by the unity of individual subjects, has of late been rejected, and with good reason. And with this idea disappears any formal or universal necessity that may have been supposed to attend the arrangement of attributes as designations of successively wider aggregates of individual subjects. It is important that we should dismiss the notion that the

higher degrees of knowledge are necessarily and in the nature of intelligence framed out of abstractions that omit whatever has interest and peculiarity in the real world. Nothing has been more fatal to the truth and vitality of ideas than this prejudice, which I do not admit to be a just representation of the principles of Plato and Aristotle, although certain salient features of their doctrine gave it an unfortunate advantage. If the present reaction against formal logic should end in establishing a more vital conception of universality than that which sets it down to mere abstraction, a fundamental reform will have been made in philosophical first principles.

Truth of 'inverse ratio.'

iii. Nevertheless, subsumption and abstraction play a part in knowledge. It is not quite certain that there is any judgment or argument which is incapable of being exhibited in subsumptive form. It is certain that to abstract and to distinguish—to know what belongs to one relation, and what, again, though conjoined with that relation, yet does not arise out of it, but out of some other condition or cause —is the first duty of the scientific intelligence. In consequence of this activity, arrangements of individual objects under a series of abstractions, each applying to a wider aggregate than the last, meet us on every hand, and most obviously of all in family relationships as estimated among civilised nations. The question before us cannot be dismissed until we have treated it from this more real point of view. Is the 'pyramidal' arrangement of concepts, subordinating the less to the more abstract, scientifically convenient, or, what in an ultimate sense comes to the same thing, is it true? In answer to this question I will mention three points of interest.

Alternative classifications.

a. Sigwart reminds us that every concept may be regarded from different points of view, and classification or abstraction may therefore have different lines open to it: e. g. do we class a square first with four-sided figures, and then, subject to that limitation, with equilateral figures, or *vice versa*? It is obvious that we put the square in quite

different company according to the order in which we apply these points of view. The point is that in this and similar cases we seem to have *bona fide* alternatives. No serious attention would be needed by the mere fact that we can class a copy of 'Paradise Lost' either as a black or as a rectangular object. But if genuine alternative classifications are possible, it is clear that we may have a hundred objects before us, and being forced to divide them into classes from each of ten unconnected points of view, may be left with ten different classifications for each object, and apart from some peculiar ground there will be no reason for subordinating each object decisively to one classification rather than to another.

The first remark that such a suggestion invites is that the idea of alternatives only touches the subordination of every object to one class or series of classes, but does not touch the alleged necessity of successively emptier abstractions within any one point of view which may be selected (as some one must always be selected at least *pro hac vice*) and adhered to. And, secondly, the mere difficulty of alternatives is inherent in the nature of intelligence, meets us in the problem of giving names, and is overcome in some degree whenever we venture to affirm a fact. In its most genuine form it is met by the theory of the relation between different sciences, to each of which the same individual thing obviously presents a different aspect. Sigwart's suggestion [1] of an inference to Pantheism from the doctrine of essence combined with that of subordination—because only the essence of the highest abstractions is in no relation accidental—seems to me perfectly wild. We should by this time be well aware that all essence is relative, but that relativity does not exclude absoluteness. One set of attributes are a man's essence *qua* citizen, and another *qua* parent. I may add that his argument depends on assuming that any class may be regarded in its turn as genus and as species. But this is

[1] Logik, i. 308.

an obsolete conception belonging to purely formal logic. The successive abstractions of classification have distinct characters expressed by definite titles and not interchangeable. A genus is not a species of an Order, and a Class is not the genus of a Division.

Higher Individuals.

β. A group of objections which carry on the idea discussed above of abstraction by modification as opposed to mere neglect or omission of attributes, appears to me to be more important. If we look at a real individual into which other individuals enter as constituent parts, are we prepared to say that the containing whole (e.g. the state as compared with the citizen) has the less meaning or intension of the two? The old logic would retort here that the extension of 'state' is made up of particular 'states,' not of persons, or that that of 'nation' or 'army,' consists in the several nations and armies, not in individual men and soldiers; or that the extension of God is in his particular existence (as we do not here admit a plural) not in elements within God's being. But this would only meet the objection at the cost of narrowing the idea of universality to that of mere abstraction, in contrast with the sense—synthesis of differences—in which we have taken it throughout. Moreover, even the aggregate of men, nations, or animals which is indicated by an abstract universal name has in virtue of that universal a common nature which is a germ of concreteness. A crowd is not an army, but it has in it always the elements of a mob. As we saw above, collective names mark a mere half-way house from aggregation to individuality and it is a purely arbitrary procedure when examining the nature of universals, to restrict our notice to such as have attained to no higher embodiment than an aggregate of particulars. But in fact our prejudices would cause us to neglect a concrete nature if any such were apparent within the aggregate. We should insist that the idea which should include the states or nations of the world *must* have less import than the idea of England or France, and should *therefore* look for this idea in the abstraction 'state' or

'nation,' neglecting to consider whether, e.g. as the source of international law, the aggregate of nations has not in it something beyond the elements common to various peoples, or whether, if this is not so, the absence of such a central unity is not at least a defect which we might hope to see amended.

But even if we yield to tradition so far as to conceive of all universality as arising by way of abstraction, we have a further difficulty to meet. It has been well pointed out that even abstraction in the scientific sense is not mere omission of attributes from the idea of a kind[1]. If, in a generic conception, all attributes were omitted which are variously modified in the species under it, the conception would as a rule be stripped of its entire content. That it could ever have been thought possible to distinguish between attributes which are the same in all species of a genus, and attributes which are different in the different species, must have been owing chiefly to superficiality in the analysis of attributes and a neglect of their real concrete character. It is easy to say that animality is common to men and beasts, while rationality belongs to men only, and in place of it animals have either instinct or nothing, and that therefore animality is the intension of the class which includes beasts and men, while each of these subclasses has a separate and additional intension. But in fact the animality of men is quite different from the animality of beasts, and is not an attribute common to both in the sense in which a tree-trunk is the common support of two of its branches. While on the other hand the thorough modifications which distinguish the intelligence of man from that of animals do not suffice to dissociate them beyond identification; and the class-conception which simply omits all reference to intelligence is an inadequate class-conception for men and animals. Therefore the notion or abstraction which is to include both men and animals must on the one hand provide for a variable animality;

[1] Lotze, Logik, sect. 23.

must be considered, that is, not in the light of a fixed mark, but as a scheme of modifiable relations; and must, on the other hand, find room for some reference to intelligence, and not simply strike it out as a mark in which the kinds to be classified are not the same. *Prima facie* then the content of the superior class-conception is made up of the very same elements as those of the conception nearer to individual reality, only that it must represent each attribute schematically, by limits of variation, instead of embodying a fixed system of amounts or values. It is obvious, however, that this principle can only apply to the few most concrete abstractions nearest to sensuous reality, in spite of the allowance to be made for cases in which the total absence of an attribute in some subordinate kind may be intelligibly set down as an extreme instance of its fluctuation, and therefore does not require all reference to such attribute to be omitted in the class-conception to which the defective species is subordinate[1]. Even when we come to Organism as including both plant and animal, we must sacrifice, it would seem, something of content. It is hard to say whether we could ever be justified, for instance, in including sentience in the general idea of organism, in order subsequently, according to the principle just mentioned, to deny it to 'Plant.' The more general abstractions of the type just mentioned become rather groups of laws or conditions by which individuals are controlled than characteristics of the individuals in themselves. But that all their characteristics, besides being characteristics, rest upon conditions no less universal and absolute than these laws,—this must never be forgotten. The question of mere marks which do not enter into the main line of natural classification has been treated above in speaking of alternative classifications. The truth of these alternative modes of looking at reality

[1] It is a common thing to find within a genus of plants which are not ranked as apetalous the entry referring to some one or more species 'Petals o.' In such a case the other species usually reveal minuteness or tendency to abortion of the petals. See on this whole subject, Lotze, Logik, sect. 23 ff.

is bound up with the question of the relative truth of the various sciences.

Thus it is clear that immense deductions must be made from the traditional doctrine that Intension and Extension vary inversely. It has been seen that the one may vary without the other, that they may vary together, that inference and judgment are not restricted to a subsumptive scheme, that individuals may be universal in a sense which does not depend upon abstraction, that thus the whole *vraisemblance* of the doctrine vanishes so far as the construction of individuals is concerned; and that even if we deal with the abstractions of common classification the true proximate genus, as distinct from a mere abstract mark, has a content as rich as that of the species, though more schematic.

Inverse ratio justified.

γ. Nevertheless, I cannot think that Wundt is right in tracing the relations between class-idea and individuals to the mere effort of language to economise its store of words. The whole fabric of the organic and even of the inorganic world creates *prima facie* an overpowering impression that natural classification can correspond to reality. The perceptible fact of graduated affinity has in all ages taken precedence of its causal explanation. The facts of human or animal descent, so far as immediately observed and as embodied in systems of relationship, supplied a name, if not a thorough-going explanation, for the affinities observed in nature[1]. The degrees of family connection, at least in mature European society, are the simple prototype of the ordinary process of classification; and the analogy has extended since the earliest days of Logic to the inorganic as well as to the organic world. Now the alleged relation of Intension and Extension may be simply illustrated by the characteristics shared by a group of first cousins, i. e. persons descended from the same grandparents, compared with those shared by second, third, or fourth cousins, whose

[1] See Lotze, Logik, sect. 30, on the probable original meaning of γένος and εἶδος.

common descent is more remote by one or by several generations. In the human race, indeed, individuality of mind and disposition has so much to feed it in special knowledge and experience that the phenomena are but irregularly observable; but in the evolution of plants and animals their characters have the same graduated identity without the same deductions on the score of special training and mental development. And it is not only evolution by descent that will produce these pervading affinities. Cognate processes of causation result in kindred formations all through the world of inorganic substances; and even in the sphere of necessary ideas, of number and geometrical figure, identical relations, under varied conditions, produce the appearance of graduated kinship or affinity.

Granting, therefore, in accordance with what has been said above, that the work of abstraction should be represented *not* as selective omission *but* as constructive analysis, and that the blanks in a schedule of attributes common to a large range of existence are not *mere* blanks, but zero values that may become positive in some cases; still we cannot on the whole deny that the graduated operation of natural causes is most fittingly embodied for knowledge in a hierarchy of abstractions. It is said that the *summum genus*, 'thinkable content,' or some such conception, must on such a scheme be empty and futile. But when we have surrendered the precise inverse ratio of Intension to Extension, I see no ground for this reproach. Why should we pursue abstraction to a useless point—to a point, that is, at which the conception which we reach ceases to be a penetrating and illuminating law? If philosophy has nothing sensible to say about thinkable contents as such, then we had better not pay attention to this highest abstraction. But philosophy can hardly be expected to make so suicidal an admission.

It must be remembered, however, that as has been shown above, where the higher concept is not a mere law, but a concrete real whole, the idea of diminishing Intension has

no application whatever. It is for special knowledge to determine how far these different points of view are respectively to be taken. Psychology subordinates the human soul to a set of laws which include, as they grow more abstract, a larger range of animal and organic existence. Political science treats the same spiritual being in its concrete relations within an actual community of such beings—not as a mere member of a class. To which of these two sciences that of Ethics ought to assimilate its procedure is a vexed question which illustrates the problem of deciding in what regions the rule of diminishing Intension applies.

One more suggestion may be ventured which aims, it will be said, at rehabilitating an old fallacy. I am unable, however, to persuade myself that it does not appeal to an unquestionable truth. I assumed above, for the sake of simplicity, that regressive abstractions such as figure in classification could represent in respect of their abstractness no character of reality. The grandparents from whom a cousinhood is descended have often a more real, marked, and individual character than their grandchildren, though what these latter retain of that character can only be represented by an abstraction, much of it having been lost and supplemented from other sources. The grandparents are represented by an abstraction, in the existing first cousinhood, but were not themselves in any way more abstract than their descendants. But when we look at long intervals of evolution the matter undergoes a change, as is easily verifiable in the case of human character and intellect. A savage has not the individuality of a modern European; he *is* more abstract; his nature includes fewer differences, less profound feelings, less grasp of fact, and less definiteness of imagination. Or to take a more tangible instance (for the facts of savage life are always subject to dispute if not to doubt), even the Greek intellect in its prime, or Greek art at its best, has not the many-sided concreteness that belongs to Shakespeare or Goethe, Raphael or Turner.

And indeed, if we go to natural history, and say that 'Organism in the abstract' never existed, really the Amoeba or the white blood corpuscle seem to contradict us. It is hard to see how every successive generation or epoch of evolution, so long as growth is not counterbalanced by decay, can avoid adding import and significance to the content of things. With the mind this is admittedly the case, and the course of evolution seems to show it in nature too. It may be said that the antecedent is no more abstract than the consequent, and that the universe as a whole cannot grow either more or less concrete. But it may be doubted whether this formal argument applies to a system which has individuals within it. In bringing to bear its total content upon such individuals there seems to be scope for infinite grades of concreteness. In this case the advance from abstractness to concrete individuality would have grounds in historical fact. In one form or another this idea has often been maintained, and I think that it bears witness to a truth.

We have now considered the primary aspects of the materials or instruments of logical thought—the idea and the name. This discussion seemed appropriate to an Introduction, because it is impossible to admit that the name, concept, or idea, is a portion of the content of Logic, in the sense in which such a position is assigned to the Judgment and to Inference. We do not enter upon logical development proper till we come to deal with the evolution and affiliation of judgments.

BOOK I.

Of Judgment.

CHAPTER I.

Of Judgment and Judgment-forms in general.

I. The Nature of Judgment as such.

Judgment is co-extensive with affirmation and denial, or, which is the same thing, with truth and falsehood. True and false are not indeed terms applied exclusively to judgments; but yet in all their applications their essential meaning depends upon judgment. The sensations of a diseased organ may be abnormal, but cannot possibly be false unless, on the strength of them, we judge erroneously. A false note is a real sound, a false man is an actual individual. It is not their existence, but a judgment implied in their nature, that gives meaning to the censure of falseness. The musical note is not what its place demands; the man is not what he pretends or aspires to be; it is the demand or pretension, ascribed actually or by metaphor to thing or person, which condemns them as false in as far as it is unrealised.

Thus truth and falsehood are co-extensive with judgment, and depend on the fact which is its primary condition; the fact that a thing may have an ideal relation to reality over and above its own particular existence; so that its existence, though in itself real and actual, is empty and valueless in the absence of the further reality that such a relation demands. Truth must belong to something whose unreality is not simply non-existence; or how could falsehood exist? The essence of falsehood or fiction is that there should be an actual something that pretends to be something else.

Thus if we describe Judgment as the act of thought which is capable of truth and falsehood, the description, although tautologous, is not unsuggestive. It tells us that we are to look for the differentia of judgment not in a mere mental fact, but in some further value with which the mere mental fact is invested.

Symbolic ideas.

i. This primary condition of judgment recalls us to the subject of the Introduction. In judging, we use ideas, but the ideas which we use are not mere particular mental images, the perishing existences which pass through consciousness, and which, *qua* particular psychical states on a level with mere sensations, never recur. Ideas [1], according to Locke, though particular in their existence, are general in their signification. In judgment, ideas are employed solely for the sake of their general signification, and without reference to their particular existence. An idea, considered as a general signification, is what was described in the Introduction as the meaning of a word. It is not without effort, as we all know, that we can find in our consciousness any intermediary between the word on the one hand, and the reality on the other; and when it is brought to our notice that a reality cannot as such be a state of our individual consciousness, we are sometimes tempted to deny that it has any representative there beyond the name. We see from this how utterly the symbolic and secondary employment of psychical images obliterates all consideration of their particular existence as mental occurrences. We no more take note of them than, on meeting a welcome friend, we give ourselves a detailed account of the peculiarities by which we recognise him. The word and its reference—a reference to some continued identity in the world of meanings [2]—are inextricably welded together. It is only by reflective analysis that we discover, within and auxiliary to the meaning of a word, the particular psychical images by help of which we symbolise it.

[1] Essay on Human Understanding, Book III. chap. 3. sect. 11.

[2] See Introduction, sect. 7.

And the meaning tyrannises over the psychical image in another respect. Besides crushing out of sight its particular and exclusive existence, it also crushes out part of its content. The psychical images that pass through our minds might be compared to a store of signal flags. Not only is it indifferent whether your signal flag of to-day is the same bit of cloth that you hoisted yesterday, but also, no one knows or cares whether it is clean or dirty, thick or thin, frayed or smooth, so long as it is distinctly legible as an element of the signal-code. Part of its content, of its attributes and relations, is a fixed index which carries a distinct reference; all the rest is nothing to us, and, except in a moment of idle curiosity, we are unaware that it exists. The well-known difficulty of detecting misprints arises from the same despotism of the meaning. Let the main index-letters of a word be correct, or even the main index-words of a sentence, and we are off at once in thought to the word or sentence which is indicated, and remain unaware of minor variations in the content employed as index.

Thus the idea, as used in judgment, is a general signification, or in other words, a fixed reference. And because fixed, it is limited; limited to portions of content which serve as indices of the reference, and are compatible with psychical accompaniments that vary with the series of mages. I will give another instance. Some one speaks to me of the Aegean Sea, which I have never seen. He tells me that it is a deep-blue sea under a cloudless sky, studded with rocky islands. The meanings of these words are a problem set to my thought. I have to meet him in the world of objective references, which as intelligent beings we have in common. How I do this is my own affair, and the precise images at my command will vary from day to day, and from minute to minute. It sounds simple to say that I combine my recollections of sea and sky at Torbay with those of the island-studded waters of Orkney or the Hebrides. Even so, there is much to adjust and to neglect;

the red cliffs of Torbay, and the cloudy skies of the north. But then again, my recollections are already themselves symbolic ideas; the reference to Torbay or the Hebrides is itself a problem set to thought, and puts me upon the selection of index-elements in fugitive images that are never twice the same. I have *first* to symbolise the colour of Torbay, using for the purpose any blue that I can call to mind, and fixing, correcting, subtracting from, the colour so re-called, till I reduce it to a mere index-quality; and *then* I have to deal in the same way with the meaning or significant idea so obtained, clipping and adjusting the qualities of Torbay till it seems to serve as a symbol of the Aegean.

Here then we have the first essential of judgment. The ideas used in judging are not particular existences but general significations, or objective references. No mere mental occurrences as such, no series or combination of particular images, can by any possibility be a judgment. It is the essence of judgment to claim a value which is beyond the mere mental act itself, and which is therefore liable to be divorced from the mental act; and this divorce, as we have seen, is what falsehood means. That is false, which *is*, but like a false coin, has not the significance which it claims. In judgment, then, all ideas are symbolic, that is to say, have a constant reference.

Can ideas be symbolic apart from judgment? If no ideas in a human consciousness *are* apart from judgment (see Introd. 2. ii) this question falls to the ground so far as concerns that consciousness. But the discussion referred to made it clear that *apart from ultimate analysis* we do entertain ideas without judging them true, as in the question and in the negation, and that these ideas are symbolic. The further problem may then be pressed upon us: 'Are there at all ideas which are not symbolic?' In identifying the *human* intelligence with a continuous judgment we seem to have denied in advance that non-symbolic ideas *are*, for that consciousness. The answer is that *a*. In judgment itself the idea can be distinguished *qua* particular in time or psychical

fact, and *so far* is not symbolic, and β. In all those human experiences from which we draw our conjectures as to the animal intelligence, when in languor or in ignorance image succeeds image without conscious judgment, we feel what it is to have ideas as facts and not as symbols.

Reference to reality.

ii. Granting that symbolic ideas cannot ultimately be entertained without judging, it does not follow that to judge is merely to entertain ideas. In what does the act of judgment consist? An act it undoubtedly is; an act which is as certainly present, and which we find as hard to describe, as the much disputed act of volition itself.

I shall attempt in the first instance to make the essentials of the matter quite clear in a simple case, with which we shall afterwards find that all more elaborate instances agree in fundamental structure.

If I say, pointing to a particular house, 'That is my home,' it is clear that in this act of judgment the reference conveyed by the demonstrative is indispensable. The significant idea, 'my home,' is affirmed, not of any other general significant idea in my mind, but of something which is rendered unique by being present to me in perception. In making the judgment, 'That is my home,' I extend the present sense-perception of a house in a certain landscape by attaching to it the ideal content or meaning of 'home'; and moreover, in doing this, I pronounce the ideal content to be, so to speak, of one and the same tissue with what I have before me in my actual perception. That is to say, I affirm the meaning of the idea, or the idea considered as a meaning, to be a real quality of that which I perceive in my perception.

The same account holds good of every perceptive judgment; when I see a white substance on a plate and judge that 'it is bread,' I affirm the reference or general meaning which constitutes the symbolic idea 'bread' in my mind, to be a real quality of the spot or point in present perception which I attempt to designate by the demonstrative 'this.' The act defines the given but indefinite real by affirmation

of a quality, and affirms reality of the definite quality by attaching it to the previously undefined real. Reality is given for me *in* present sensuous perception, and *in* the immediate feeling of my own sentient existence that goes with it. The real world, as a definite organised system, is *for me* an extension of this present sensation and self feeling by means of judgment, and it is the essence of judgment to effect and sustain such an extension. It makes no essential difference whether the ideas whose content is pronounced to be an attribute of reality appear to fall within what is given in perception, or not. We shall find hereafter that it is vain to attempt to lay down boundaries between the given and its extension. The moment we try to do this we are on the wrong track. The given and its extension differ not absolutely but relatively; they are continuous with each other, and the metaphor by which we speak of an extension conceals from us that the so-called 'given' is no less artificial than that by which it is extended. It is the character and quality of being directly in contact with sense-perception, not any fixed datum of content, that forms the constantly shifting centre of the individual's real world, and spreads from that centre over every extension which the system of reality receives from judgment.

Waiving then this distinction, though as a matter of degree it may find a place in the enumeration of judgments, we find the same general features in all judgments of perception. There is a presence of a something in contact with our sensitive self, which, as being so in contact, has the character of reality; and there is the qualification of this reality by the reference to it of some meaning *such as can be* symbolised by a name. It cannot be alleged in theory that a name is essential to judgment. At least for 'name' it would be necessary to substitute in such an allegation 'some symbol.' The spatial order of things which we see whenever we open our eyes, is, *qua order of things*, the content of a perceptive judgment, in

which universal ideas are presented through sensuous symbols.

The subject in every judgment of Perception is some given spot or point in sensuous contact with the percipient self. But, as all reality is continuous, the subject is not *merely* this given spot or point[1]. It is impossible to confine the real world within this or that presentation. Every definition or qualification of a point in present perception is affirmed of the real world which is continuous with present perception. The ultimate[2] subject of the perceptive judgment is the real world as a whole, and it is of this that, in judging, we affirm the qualities or characteristics.

The claim to be true, which as we saw belongs primarily to judgment, indicates the same relation. In every judgment, as Mill incisively contends, we profess to speak about the real world and real things. 'The Sun' means 'the Sun'; and whatever that may be, it is not anything *merely* in my mind; not relative purely to me as a conscious organism; not a psychical fact in my individual history. Every judgment, perceptive or universal, might without altering its meaning be introduced by some such phrase as 'Reality is such that——,' 'The real world is characterised by——.'

Thus in the Perceptive Judgment at least we find the meaning or objective reference of an idea—such a content as is indicated by a name—affirmed to characterise some reality present in sense-perception, and through it, reality as a whole. We shall find that all Judgments of every kind share the main elements of this description; only that the reference to an indeterminate element of present sense-perception is gradually displaced by the introduction of explicit ideas to designate the immediate subject. Such

[1] See Introd. 2. i.

[2] See Introd. 2. i. Analysis and cross-examination readily verify this as a fact. After admitting any judgment to be true, you cannot deny its modifying effect on any portion whatever of your real world; i.e. it has been admitted of the real world as a whole.

ideas disguise but do not remove the reference to Reality as the ultimate subject in every judgment; they have, however, important effects in modifying both the act of affirmation, and the nature of what is affirmed. When I come to examine the chief types of judgment, I shall have to consider the nature of these effects. But I intend in the first place to say something of the proposition, from the analysis of which many current views about judgment are derived.

Judgment and Proposition.

iii. The enunciative sentence — the unit of language which represents a judgment — is called a proposition. Language, as we saw, supplies the fixed symbols which stand for ideas. It would be rash to say that there can be thought without language—*if language includes every possible system of recognisable signs*—and wholly perverse to imagine that the ideal of intelligence lies at all in the direction of a severance of thought from words. The Introduction, in dealing with Names, showed us the absurdity of any such conception. But yet the spoken or written proposition differs fundamentally from the judgment.

I do not think that it is convenient to rank the narrative or temporal affirmation as a 'proposition' (German 'Satz'), and reserve the name of judgment for an act of thought which has some purpose in the way of classification or definition. To do so is in English terminology at least to confuse a distinction of degree with one of kind; but it is worth noticing that such a nomenclature has been proposed [1], and that according to it judgment proper would begin at the point where inference and necessity become explicit. For against any *doubt*, judgment maintains itself as an inference [2], and this is exactly the test that has been held to distinguish a judgment from a proposition. To affirm that a carriage is passing the house, Hegel says [1], is not a judgment unless there is a question, e.g. whether it is a carriage or a cart; i.e., I suppose, unless some general

[1] Hegel's Logic, Wallace's Translation, pp. 258–9.
[2] Bradley, Principles of Logic, p. 404.

connection of attributes is intentionally affirmed. Now a general connection involves a ground, and so an inference. Thus the classification in question would have the merit of suggesting that judgment begins with inference. But the point of commencement taken is really arbitrary; though judgment and inference begin together, yet both begin before this point.

I prefer then to take the proposition all through as the actual spoken or written enunciative sentence; while the judgment is the intellectual act which depends in various degrees upon words or other symbols, but is different from any mere combination of words or symbols whether heard, read, or remembered.

The essential differences between judgment and proposition may be arranged under two heads, which cannot however be wholly separated from each other. I shall first speak of the so-called *parts* of the judgment, the current conceptions of which are derived from grammatical analysis of the proposition; and then pass on to consider how far the idea of a transition in time, which is inseparable from the apprehension of a sentence, is applicable to the judgment as such.

The parts of the judgment.

a. The division of the Judgment into Subject Copula and Predicate is obviously derived from the analysis of the enunciative sentence. The finite verb, which is a proposition in miniature, contains all these elements within itself; and the history of their being distinguished within the sentence is the history partly of linguistic evolution and partly of grammatical or quasi-logical analysis. Even the separation of the substantive from or within the verb, is, I suppose, an early analytic development of language; and it is the tendency of modern speech, no less than a supposed convenience of thought, that has finally transmuted Nominative and Verb into Subject Copula and Predicate. The Copula in the modern sense was unknown to Aristotle, although the use of the predicative Verb 'to be' attracted his attention and drew

from him a somewhat inadequate explanation. If we return, however, to Aristotle's main position, and, in agreement with students of English grammar[1], regard the Judgment as made up of Subject and Predication (*ὄνομα* and *ῥῆμα*), we have got rid of one fiction in the separate Copula, but the distinction which we retain may still be challenged. It is plain that the judgment, however complex, is a single idea. The relations within it are not relations between ideas, but are themselves a part of the idea which is predicated. In other words, the subject must be outside the judgment in order that the content of the judgment may be predicated of it. If not, we fall back into 'my idea of the earth goes round my idea of the sun,' and this, as we have seen, is never the meaning of 'The earth goes round the sun.' What we want is 'The real world has in it as a fact what I mean by earth-going-round-sun.'

This view, stated thus extremely, would not only annihilate the copula with separate content, but also the whole distinction of Subject and Predication, and it is an argument in its favour, that, in doing so, it would seem only to lay bare in all judgments the elementary type which forces itself on our observation in the simplest perceptive apprehension; at a stage, that is to say, before the grammatical subject, which creates our present difficulty, appears explicitly in the proposition. But we shall see in tracing the evolution of judgment, that it is impossible to dispense with the distinction of Subject and Predication, and that the appearance of contrast between propositions which have and which have not grammatical subjects, is caused by the necessity of representing immature thought in developed language; so that the thought in which distinctions are rudimentary must either be mutilated by the omission of an element, or transformed by explicit articulation. It is impossible to *represent* a judgment by a single noun belonging to a modern language, though such a noun is often all that we

[1] Cp, Mason's English Grammar, Jones's Analysis of English Sentences, and Wrightson's Functional Elements of the Sentence.

utter. Such a judgment should really be represented either by a rudimentary sentence, that is, by some element of language not yet reduced to the position of a part of speech, *or* by a miniature sentence, i.e. by a verb.

In other words, although the ultimate Subject extends beyond the content of the judgment, yet in every judgment there is a starting-point or point of contact with the ultimate subject; and the starting-point or point of contact with reality is present in a rudimentary form in the simplest perceptive judgment, as it is explicitly in the later and more elaborate types.

Then it would come to this. Subject and Predicate in the actual judgment are really distinct, as a real identity from or in its differences. The relation of their contents *is* itself ideal, and not a relation between ideas; but nevertheless the judgment demands this relation; for the judgment is my consciousness *qua judging*, and my consciousness in judging identifies the ideal or symbolised reference which constitutes the predication with its own construction of the Real world[1].

The difficulty is that you cannot affirm without introducing a distinction or reference into the content of the affirmation; and yet such distinction or reference, being part of what is affirmed, and not a relation between what is affirmed and something else, cannot, it would seem, be the essence of the affirmation. What is the connection between the two things; between the reference of 'is-building-a-wall' to 'Balbus,' and the affirmation that the *whole* idea 'Balbus-building-a-wall' is true of reality? What has the action of Balbus to do with my affirmation that Balbus acts? The latter seems wholly unconnected with the former, and yet they are inseparable.

And the answer is that the real world is primarily and emphatically *my* world. I take it to be real in virtue of its contact with me. Therefore though the ideal relation within a judgment is not a psychical fact in my mind but a

[1] Cp. Introd. 2. i.

fact affirmed objectively of the real world, yet, the real world for me being the world that hangs from my present perception, I identify my assertion about it with its assertion of itself. In every judgment the ultimate subject Reality is represented by a *selective* perception, or idea, which designates a something accepted as real. This something, taken as standing for reality, is the actual subject of the judgment, and is qualified by the ideal content which forms the predication. No judgment can be found in which Subject and Predicate are not apparent. Reality is one, but its presentation varies; and it is impossible to judge without explaining where and how Reality accepts the qualification which we attach to it. The presentation of Reality, qualified by an ideal content, is one aspect of Subject and Predication; and my individual percipient consciousness determining itself by a symbolic idea, is the other. That the latter is identified with the former follows from the claim of conscious thought that its nature is to know.

Thus I am of opinion that Subject and Predication are essential elements in the Judgment. But whereas in the judgment they are differences within an identity, in the proposition they are isolated parts of an extended whole; and the copula, which in Judgment is merely the reference that marks predication, and has no separate content, becomes in the proposition an isolated part of speech. When therefore the analysis of the proposition controls the interpretation of the judgment, each of these parts of the sentence is treated as a separable content, and perhaps as a separate psychical existence; and we are told of two ideas or two ideal contents, and a variable copula, itself also an ideal content, which indicates the varying relations [1] between them. In this sense Subject and Copula and Predicate are mere fictions. The judgment is not a relation between ideas, nor a transition from one idea to another, nor does it

[1] Lotze, Logik, sect. 52. It is very doubtful whether in this passage Lotze escapes the error which he imputes to others, of 'reducing a logical operation to a mere psychical occurrence.'

contain a third idea which indicates a particular kind of connection between two other ideal contents.

The real nature of the copula we have seen already. It is the mere sign of affirmation, and, though usually conveyed by a finite verb in languages which possess one, does *not* depend on tense. Aristotle, who was inclined to include 'indication of time' in the differentia of affirmation, was nevertheless aware that judgment could take place 'absolutely' (ἁπλῶς) as well as with note of time (*κατὰ χρόνον*). Moreover a verb can exist without definite tense, and predication can exist apart from a distinctly formed verb.

The reason why the verb, where there is a verb, is appropriated to the act of predication, is not that the verb signifies time, change or action, but that it is, as has constantly been repeated, a miniature sentence. Not merely does the verb 'agree' with its subject—the adjective also agrees with its substantive—but by convention, or explicitly in the person-ending, it includes within itself a reference to given reality, and can therefore stand alone as an enunciation, which no other part of speech can do. In other words, the verb is *prima facie* a content referred to a real individual subject, and though the subject may be by the help of additional phrases defined, set down as imaginary, or even denied, the verb has always in itself the force of this demonstrative reference. An adjective implies a reference to something else, but the something may be a mere idea; it is only the verb that professes to select an element directly related to the speaker's apprehension, and to attach a significant content to that element.

It is in the demonstrative force of the verb that we must look for its fundamental predicative force. I suppose that the collocations which in Greek, and more or less in many languages, have power to turn the epithet into a predicate, owe their significance to a quasi-demonstrative emphasis. In 'the white horse' (*ὁ λευκὸς ἵππος*) there is nothing that can be taken as a reference to a special point in reality; no

indication of a real existence, either in the ideal content or out of it, which we propose to qualify by its meaning. In 'the horse (is) white' (ὁ ἵππος λευκὸς) there is an indication of a line between *α* an individual that may be real and *β* a content that may be attached to him or it, and therefore the instinct of reason which sees a judgment wherever a judgment is possible, takes the individual named as if it were an appeal to perception, i. e. a demonstrative reference to reality, and the content as a quality ascribed to the real subject so obtained. In the universal judgment this demonstrative reference becomes merely formal; but it continues in all language to supply the symbol of judgment.

Judgment in relation to Time.

β. It has been proposed to distinguish Subject and Predicate simply as earlier and later in time, and the above instances of demonstrative reference appear to support this notion. But rather than admit it to be correct, I should surrender the distinction altogether and adopt the view that there is no subject in the judgment as such. For it is absolutely impossible that priority in time should subsist between the parts of a completed judgment. But if not, the priority of the subject would exist merely in memory; and an act of thought cannot be characterised by a mere recollection of the process that generated it.

In what sense is it true that the Judgment is in time, and in what sense not? It may be convenient to distinguish between arriving at the judgment, and subsequently modifying the judgment, although the two processes are, as we shall see, really continuous.

In what follows I do not identify the aspect of Judgment as in time with the series of images *qua* psychical occurrences that pass through the mind while we judge. It is probable that the view which defines Judgment as a change is influenced by the particularity of ideas *qua* events of consciousness as well as by the constant transition from judgment to judgment. But the former element ought to have been eliminated by what has been said above.

Arriving at Judgment.

1. In arriving at a Judgment, as when we hear a sentence

and 'wait for the verb,' or scrutinise an approaching person until his name comes into the mind, we undoubtedly appear to begin with a ready-made Subject, to which a Predicate is added by a subsequent transition. But closer attention will show us that this is not the case. We have always some anticipation of the meaning of a sentence, and this anticipation takes the shape of a provisional judgment or judgment in outline, very probably disjunctive in type, the shape of which becomes more definite as we follow the sentence, until the final clause determines its ultimate content. In the first place, consciousness, when any ideal content whatever is presented to it, absolutely refuses to abstain from judging; and in the second place, what comes first could not have (as it undoubtedly has) the significance of a subject, unless with reference to something already referred to it in the way of predication.

The case of perception leads to the same conclusion. You can come to no judgment by help of perception unless you interrogate perception; and you cannot interrogate perception unless you have in the mind some general idea as a basis for further specification.

Thus, in reaching a particular apprehension or perception, there is a transition that occupies time. But the transition is not from Subject to Predicate, which we will call S and P respectively, but from s–py (where y indicates superfluous detail, which is omitted when the perception becomes clear) through Σ–Π, to S–P. To speak of a transition from S to P is wholly false. We never have an S first, and then tack a P on to it; we have always an inchoate judgment or a choice of judgments. The process is not like adding one piece in a mosaic to another; it is more like enlarging a hole, which has centre and circumference from the beginning.

The complete Judgment.

2. What has been said of the transition by which we arrive at a judgment cannot but apply to the judgment when arrived at. It is clear indeed that we are thus led to regard the completion of the judgment as an arbitrary

distinction, dependent solely upon our momentary interest. The completed judgment, like the process by which it is obtained, obviously possesses duration. It is absurd to suppose that a judgment cannot be dwelt upon, and only exists as a momentary transition from *S* to *P*. Such a conception arises from the confusion of two points of view, either of which may be taken as a presupposition, and reconciled with the other by a mistaken compromise. It may be assumed that the judgment, as such, is not in time, and then this assumption has to be reconciled with the obvious fact that judgment as an intellectual process is a transition that occupies duration; or it may be taken as certain that the judgment is a transition in time, and then we have to face the experience that its essential parts do not fall outside each other in succession. To treat it as an instantaneous transition is a ridiculous attempt to combine the character of occupying duration with that of not being in succession. It recognises both principles, and satisfies neither.

As we have seen in the process of arriving at the judgment, the act of judging as an occurrence in consciousness presents itself in the aspect of an interval of consciousness extended in time, and therefore including successive differences within it. But it does not include succession because the nature of the judgment is to be successive, but because the flux of sensations and ideas is always pressing new material upon consciousness, and a perception, once attained, satisfies no interest by being further dwelt upon unless it gains in content from moment to moment. Thus the duration of the judgment as a transition in time is, so to speak, its external aspect, the aspect which, as a whole, it presents when compared with other occurrences in consciousness; and this duration is theoretically capable of any degree of extension. On the other hand, as between Subject and Predication, that is to say, within the judgment, there is no transition at all. *S* and *P* are modified *pari passu*, and so, as a relation between them, the judgment is

not in time. This relation is a continued identity S–P which includes within it the differences s–p, Σ–Π, and so on. The transition is not from S to P, but from s–p to Σ–Π within the general signification S–P. The idea of mere momentary existence has therefore thus much truth, that if you cut across the interval of consciousness occupied by a single judgment at any point whatever, you will always find in the plane so laid bare both S and P in one or other of their forms. They are in every minute part, but they are not confined to such a minute part. Judgment breaks up into judgments as rhomboidal spar into rhomboids, but nevertheless it is one through its whole extension.

But if a judgment can be thus extended, what do we mean by *a* judgment, and how do we know when we enter upon a new one? The question is in each case a material one, being in fact the question of continued identity, and it is impossible to give it a formal answer. As a first approximation we might say that a single judgment is any extent of judging activity that can be summed up in a single proposition. But as the proposition takes its value from the judgment, and not *vice versa*, this is no more than an appeal to the fact that we succeed in distinguishing single judgments. The question is one of continued identity, and therefore must be dealt with as concerning organised wholes or systems. A mere extension of a system, or a mere omission within a system, does not bring us to a new and different system. The clearest cases of transition from judgment to judgment are those in which language uses a mere conjunction. When, on the other hand, we have propositions united by the inferential particle, it is a matter of degree how far they stand for separate judgments. Ultimately perhaps every inference may or should be represented as a single judgment, as being a mere extension of an existing whole of thought, and not a transition to a different one. Such an idea conflicts with the traditional differentia of inference, that it *should* lead to a new judg-

ment; but this only means a *bona fide* extension of the previous whole, such that, *if taken in abstraction from the process that generates it*, it *would* appear a perfectly new judgment. At least in elementary cases it is easy to see how inevitably inference shrinks up into single judgments, if we look at the actual life of thought.

Take such an every-day judgment of mixed perception and inference as 'He is coming downstairs and going into the street.' It is the merest chance whether I break up the process thus, into two judgments as united by a mere conjunction, or, knowing the man's habits, say, when I hear him half-way downstairs, 'He is going out.' In the latter case I summarise a more various set of observations and inferences in a single judgment; but the judgment is as truly single as each of the two which were before separated by a conjunction; for each of them was also a summary of a set of perceptions, which might, had I chosen, have been subdivided into distinct propositions expressing separate judgments; e. g. 'He has opened his door, and is going towards the staircase, and is half-way down, and is in the passage,' etc. If I simply say 'He is going out' I am not a whit the less conscious that I judge all these different relations, but I then include them all in the single systematic content 'going out.' 'Cromwell Road runs east, and the Brompton Road north-east,' are two judgments; but if the road happens to be thought of *qua* continuous, one would say, 'Cromwell Road turns from east to north-east, where it becomes the Brompton Road.' Again, 'Knightsbridge and Kensington Gore run east' may be generalised as 'The street from Kensington Church to Knightsbridge Barracks runs east.'

Thus a judgment is one in respect of the continued identity of its Subject and Predication, and this identity cannot be defeated by the inclusion of difference, but only by the failure to recognise continuity. It is obvious that the generalised forms in the above instances presuppose a work amounting to colligation of facts, if not to elementary

induction and analogy. If the included judgments were never separately made, the inferential work of colligation has not been explicitly done; but it would be found absolutely impossible to draw the line between cases where it has been done and those where it has not. Every judgment would on scrutiny reveal differences which had more or less been absorbed into its formation. It follows inevitably that every systematic inference considered as a judgment is single and not multiple. However this may be, it is clear that extension in time is no bar to the unity of judgment.

Scheme of arrangement of Judgments.

II. Judgment, as we have seen, is primarily the intellectual act which extends a given perception by attaching the content of an idea to the fact presented in the perception. The whole of consciousness, in as far as it is the consciousness of a single world that shares the reality of our waking self, may be regarded as a continuous judgment, which qualifies our present feelings and surroundings by the knowledge of what is more remote in space and in time. From the point of view of common logic, that is of individual knowledge, the intellect sustains its world by continued effort, as Atlas held up the sky. Every judgment is an effort of this kind, affirming on the one hand that the same reality which we touch in the present is rightly described by such and such an idea, and on the other hand that such and such an idea is real with the same reality as that which we touch in the present. The 'idea' of which I am speaking is, of course, not the particular existence or single occurrence of a psychical image; it is the general signification for the sake of which we use the psychical image.

The object of this Book is to analyse judgment into its principal kinds, and, as a necessary consequence, to trace their affiliation. We shall find that no linear arrangement will represent these affinities. Judgment, as the effort of thought to define reality, must vary with the kinds of reality to be defined no less than with the degree of its success in defining them. An equation is to one kind of

whole what a definition by genus and species is to another, or an appreciation of aesthetic value to a third ; the function of judgment is present in each of these activities, and the difference between them is the difference of the wholes which they respectively analyse. They are divergent developments of the same relation, in each of which an aspect has become predominant that remains subordinate in the others.

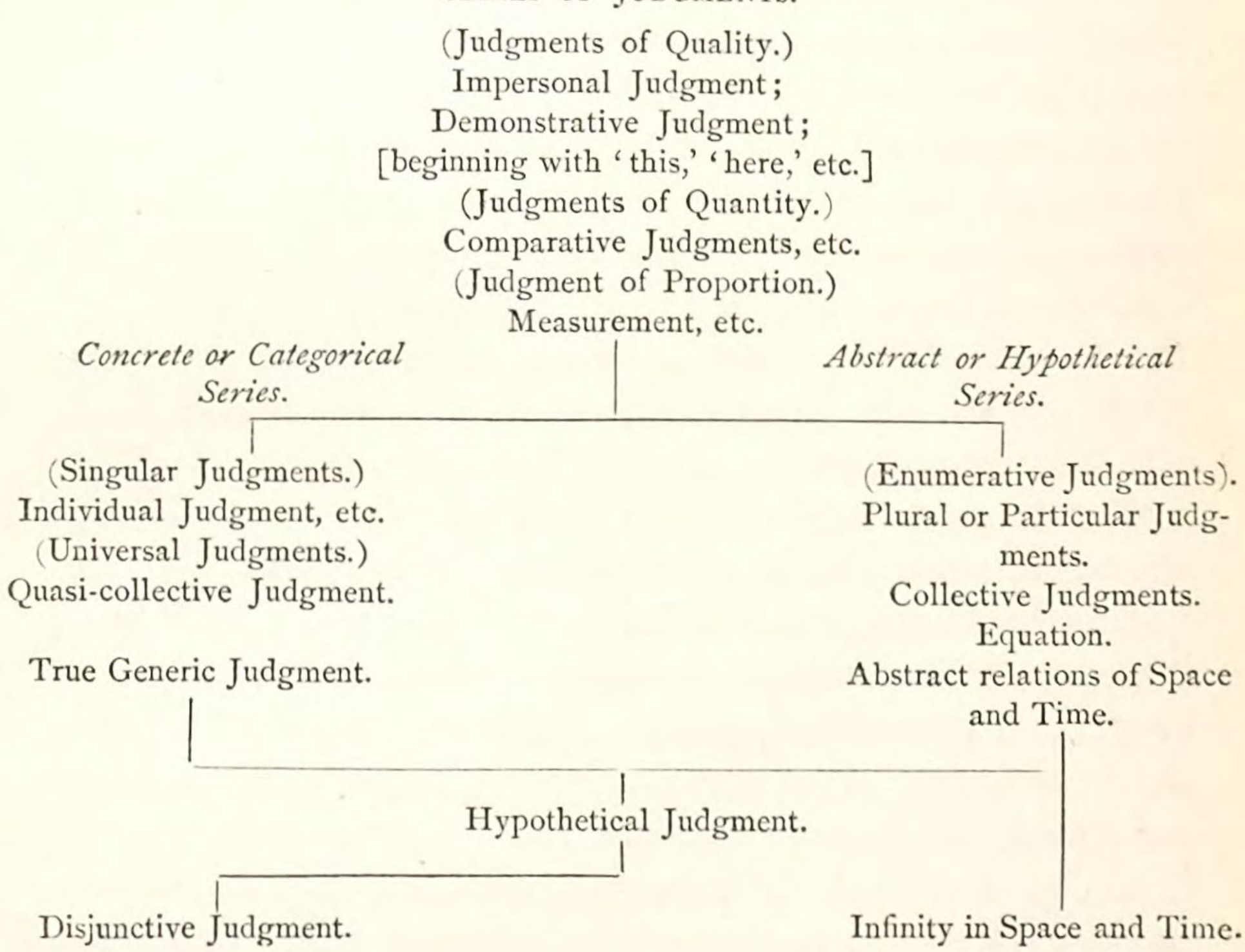
But we shall have to deal with convergence no less than with divergence. The unity of the judgment excludes no complexity of synthesis, and in determining the species of a plant or the character of a man we may be obliged to employ, among others, accurate determinations of number, time, and space. That is to say, the treatment of a content by abstraction as a spatial or numerical whole may be re-absorbed in a more concrete treatment of it as an organic, aesthetic, or moral whole.

It might indeed be urged, from the point of view of metaphysics, that every kind of judgment must have its value and no more as a contribution to the whole of Reality, and that therefore the series of judgments, arranged according to the degrees of their significance for knowledge, must after all be linear. In other words, if a whole in number or a whole in space is not final in itself, but demands something further to complete its significance, this might be enough to show that we ought not to represent it as the goal of an independent series, but rather as a stage or phase of construction, subordinate to the more concrete forms of knowledge[1]. I should not greatly object to such a view, and shall endeavour in some degree to meet its requirements by exhibiting the more complete and concrete syntheses as involving the reunion of aspects which have been developed in the abstract. But though the forms of space and time are involved as a fact in the perceptive construction of the world of individual things, yet the mathematical analysis of

[1] Cp. Plato's arrangement, in the Republic, of the mathematical sciences in an order proceeding from abstract to concrete.

these forms is an effort of the same scientific spirit which recognises the principles of order in the world of things itself. The two aspects of constructive science are co-ordinate and complementary activities of reason, and it would be ridiculous to treat geometrical analysis as prior to the perception of characteristic size or proportion. Intelligence is many-sided, in spite of its unity; and its aspects, which are correlative to each other, lose their true interdependence by being drawn out into a linear series.

SCHEME ILLUSTRATING AFFILIATION OF JUDGMENTS AS DESCRIBED IN BOOK I.



Purpose of scheme.

i. I subjoin a scheme of the arrangement which I propose to follow in the remainder of the present Book. It is simply intended to assist the reader in apprehending the

views which I submit, and is not meant to be a bed of Procrustes for the facts of logic. I take it that variations of arrangement and nomenclature are as inevitable in logic as in botany, and are not undesirable in either science; for they force upon our minds the truth that species are but sections of evolution, and that their arrangement is merely subsidiary to a correct apprehension of the process which we divide into such intervals.

Explanations of scheme.

ii. I will begin with a few words in explanation of the scheme which I have adopted.

There is no need to apologise for describing some types of judgment by appellations which are not to be found in Mill, Whately, or Hamilton. Recent attempts to restore to logic its hold on living concrete thought, a direction in which Mill was himself an able and adventurous pioneer, have made us familiar with a whole chaos of psychological, grammatical, and quasi-mathematical titles applied to phases of the judging activity. All that I have done has been to concentrate in a single review the best estimate that I could make of the typical character and true affiliation of such phases, attempting to give each judgment its appropriate place in relation to *all* the principles employed in the classification, and eschewing the too common habit of adducing various groups and appellations in two or three successive chapters, without any distinct reference of the one grouping to the other.

But besides adding to the traditional scheme of judgments, the arrangement suggested involves a dislocation of its parts, and the omission of one familiar antithesis. These innovations, though by no means original[1], may conveniently be indicated and justified in a few introductory remarks.

Categorical and Hypothetical.

a. 'Categorical' and 'Hypothetical' are taken to designate fundamental characters of knowledge, and not mere grammatical appearance. It follows that the natural series

[1] The treatment of the universal judgment as fundamentally different from the singular in categorical character was really initiated by Mill in so far as he analysed the content of affirmation into coexistence of attributes; and has been adopted and accentuated by Lotze, Sigwart, and Bradley.

of judgments commonly known as singular, particular, and universal, cannot wholly fall within the genus categorical, but at a certain point and in a certain degree assumes a hypothetical character. More especially, the formal equivalence of the singular to the universal judgment is replaced by a profound distinction of kind between the two. The disjunctive judgment again has a place and value of its own, and is not a mere proposition or grammatical form.

Divergent species.

β. The true quantitative judgment—not the 'universal' judgment of ordinary thought, which derives only its name from quantity—reveals itself as a divergence from the central development of the judgment by reason of its extreme abstraction, in which one element of the relation essential to judgment almost disappears.

Analytic and Synthetic.

γ. The familiar terms 'analytic' and 'synthetic' are not made use of in the classification, because they belong to the theory in general and are not distinctive of any particular types.

I subjoin a short explanation on each of the above subjects.

Categorical and Hypothetical.

a. A categorical judgment asserts an actual fact absolutely. A hypothetical judgment asserts only the consequence that follows on a supposition. The distinction between the two seems clear. It is the difference between 'There is a bad smell in the house' and 'If there is an escape of gas there will be a bad smell.' But when we come to the 'Universal' Judgment the line of demarcation is at once blurred. Hamilton gives 'Rainy weather is wet weather' as an instance of a categorical proposition, and 'If it rains, it will be wet' as an instance of a hypothetical. In the former, according to him, 'rainy weather' is 'unconditionally thought to exist.' But is it? *Prima facie* the two propositions represent *the same* judgment, that is to say, their difference is grammatical only, and their meanings are identical. It may be that the categorical shape conveys a presupposition which is absent from the hypothetical enunciation—the presupposition that rainy

weather exists *in rerum natura*—and into the question thus raised we shall have to enter at length later on. But it is clear at all events that the 'categorical' form conveys in this case a meaning which is in a large measure, if not entirely, hypothetical.

By referring to our account of judgment as such we shall see that the distinction before us involves a fundamental difficulty. Every judgment affirms an idea of reality, and therefore asserts the reality of an idea. Now an idea is necessarily abstract, because determinate; and therefore all judgment involves abstraction. And abstraction is the essential element of hypothesis; it consists in taking up into an idea some elements out of the content of experience, for the sake of consequences which attach to the elements so taken up. Therefore it seems, as the real world *for us* is maintained and extended by Judgment only, that in all extension and even maintenance of the given reality there is involved an element of abstraction, which is the same as to say that in all categorical judging there is an element of hypothesis. The relation of these characters to each other throughout the history of the judgment will be the main principle of the evolution which I shall attempt to describe. But we must accept as the usage of thought, which we are to explain, that the assertion of actual fact coincides as a rule with the individual or singular judgment, and that the universal affirmative of formal logic, on the other hand, *may* in every case be taken as purely hypothetical.

The categorical character of a judgment in the above simple sense may be tested by the possibility of expressing its meaning by an impersonal proposition, however awkward may be the necessary grammatical transformation. For 'Caesar was crossing the Rubicon' we may substitute 'There was Caesar crossing the Rubicon'; but for 'All men are mortal' it is impossible to frame such an equivalent, for the reference to given reality in the impersonal expression would be at once contradicted by

the abstract 'all,' which='any' or 'if a–,' and so points, in the absence of any more effective assertion of the limited unity of the race, to an infinite series. If it is possible to say 'These are all the men who, etc., etc.,' the 'all' cannot be the true generalising 'all,' but must indicate a sum of known individuals. It will be necessary however to point out hereafter that the distinction between these two senses of 'all,' or in other words the limit of individuality, is not absolute, but is a matter of degree.

These instances suggest the principle to which we shall adhere, viz. that every assertion is as absolutely categorical as the nature of its elements will permit; and that demonstrative or individual judgments are in the plainest sense categorical, because the realities indicated by their subjects are of a nature that can be given, in a way in which the realities indicated by more definite abstractions cannot. In every case the *real* subject is the reality indicated; in every case this subject is alleged to exist; but the question is how and in what way it is capable of existing; in other words, what is the kind and degree of its individuality. For only what is individual can have actual existence as a whole. An infinite series cannot have such existence, and therefore cannot be taken to have it. The 'all' in this latter case remains a demand with which we cannot comply.

Divergent species.

β. The content of a judgment is always a significant idea, that is to say, a recognised[1] identity in differences. The varieties of judgment correspond to the forms which identity in difference is capable of assuming.

An identity in relation to its differences may always be regarded as a whole in which they are parts. An expanse of the same colour includes the changing lights and several points of space through which the one identical colour extends; the policy of a government includes the details

[1] 'Recognised' is necessary to restrict the description to *significant* ideas. For a sequence of images in elementary reproduction, such as we ascribe to the animal mind, *is* an identity in difference, though we do not suppose it to be an objective reference, i. e. a *recognised* identity. See Bk. II. chap. i. sect. 3, The Reproduction of Ideas.

into which its principles are developed; the moral character of a man is a whole in which his several acts of volition are the variously dependent parts. In this wide sense, as a synthesis of differences, not as a sum of units, the relation of whole and parts is a fundamental relation of all judgment. It is only when the differences or parts assume the maximum of homogeneity, and conceal, so far as is possible, the individuality of their relations to the whole, that the parts become *units*, and the whole a *total* or a *sum*. The relation of unit to sum total, that is, of quantitative part to quantitative whole, is thus obtained by abstraction. It is not the complete natural relation of concrete identity and differences, but is a device of knowledge which by sinking all other aspects of a given content is enabled to regard it as a sum of units, that is to say, as a whole of magnitude.

For this reason it seems right to consider the judgments of number, with the kindred judgments of magnitude in space and duration in time, as belonging to an outgrowth of thought which diverges from the complete evolution of judgment. All these judgments begin as qualitative, but become quantitative by intentional abstraction, and end in the creation of ideal totalities (abstract number, abstract space, abstract time [1]) which we are unable to think of as complete, and therefore are debarred from treating as actual totalities. This, I may point out, is a case of the connection between individuality and actual existence, which I spoke of under the last head.

Analytic and Synthetic.

γ. Every judgment is both analytic and synthetic. This would not by itself be a sufficient ground for refusing to employ these terms as heads of classification, for it is more or less the case through the whole of Logic that terms must be employed to mark predominant aspects rather than exclusive characters. Nor do I find a sufficient ground of objection in the psychological comment that the judgment which adds a fresh predicate to a subject to-day must become tautologous or analytic if repeated to-morrow, and

[1] Cp. Locke's Essay, II. xiv. 21, on 'Duration.'

that therefore it merely depends on individual knowledge and memory whether a given judgment is synthetic or analytic. Any conception of dominant quality, function, or essence, is enough to make this comment futile, and without such a conception it would seem that science is impossible. It is a superstition to suppose that the progress of theoretical explanation in terms of general law threatens the doctrine of essence, form, or function. However clearly an individual thing may be explained as a section of evolution or a meeting-point of forces, there will always be a definite continued identity conferred by characteristic form or function. No explanation can destroy the actual relations of whole and parts which form the essence of everything that is real. Knowledge has quite enough fixity to give meaning to the contrast of analytic and synthetic judgments wholly apart from the progress of individual minds.

The reason why I no longer care to lay emphasis on the antithesis in question is not that it is purely 'subjective'—for this is not the case—nor even that it is only a distinction of degree—for that is the character of most distinctions in Logic; but simply that it is not a sufficiently specific antithesis to be of practical value in classification. I suppose that if the terms were to be employed, we should call those judgments analytic which attain to an adequate explanation or appreciation of a complex whole. The best instances might be the definition or the disjunction, the equation, and judgments passed upon moral and aesthetic value. In all these cases we have the whole completely given in its parts, the identity in its differences, and therefore we are entitled to consider not so much the nature of the whole reconstructed, as the exhaustiveness of the reconstruction. But, as the above instances show, adequacy or exhaustiveness exhibits itself in contents whose nature is wide apart, and therefore it has no convenient place as a general character in a classification.

On the other hand, as terms belonging to the general theory of judgment, analytic and synthetic are of profound

significance. I said at the beginning of this section that every judgment is both analytic and synthetic. This assertion demands no explanation, if we remember our account of judgment as always involving identity in difference. But I will attempt to illustrate its meaning more fully.

If I say 'Caesar crossed the Rubicon,' I start with an individual Caesar, whose continued identity extended through a certain space of time and revealed itself in a variety of acts, and I exhibit his identity in one of the acts and moments—its differences—through which it persisted. What I mean by the affirmation is that he, *the* Caesar[1] who had before conquered Gaul, and who was afterwards murdered on the Ides of March, displayed his character and enacted part of his history by crossing the Rubicon. This is a clear case of exhibiting an identity in difference. But the process has inevitably two aspects. On the one hand, I analyse the individual whole that is called Caesar by specifying one of the differences that may be considered as a part within it; on the other hand, I construct or make synthesis of the individual whole in question, by exhibiting it as a whole that pervades, and absorbs in itself, each or all of its differences. It is only an *individual* whole that is obviously present in *each* as well as in *all* of its differences, as the individual Caesar in the act of crossing the Rubicon. A totality whose unity is incomplete, such as 'all men,' is only *implied* in *each* of its differences, and is not *given as* a whole in anything short of *all*. But this does not alter the fundamental nature of assertion. Every judgment exhibits a whole in its parts, and parts as contributory to a whole.

Much has lately been said of Kant's celebrated instance, the equation $7 + 5 = 12$. We have here a total, twelve, which can be compounded in a variety of ways—if we consider numbers larger than twelve, and permit subtraction, in an infinite variety of ways—and we display this total as identical, whether expressed by its place in the series of

[1] Contrast Lotze, Logik, sect. 58.

numbers (which implies one and the simplest mode of its formation) or treated as the sum of two other totals, each of which is expressed in the same simple way. It is obvious that if analytic and synthetic were reciprocally exclusive characters, the question 'Is this equation an analytic or a synthetic judgment?' would be wholly unanswerable. If 12 were not the same number as $7+5$, the judgment would not be true; if $7+5$ gained nothing by being defined as 12, the judgment would cease to be a judgment at all. $7+5$ is one of the differences which constitute the nature of the total 12, and by *constructing* 12 in this way we ipso facto *analyse* it.

The relation of these two processes, or rather two aspects of *the same process*, is so fundamental in all knowledge, being in fact *the* relation which especially characterises knowledge as such, that I may be pardoned for continuing to insist on it by help of another set of considerations. The notion of a plain difference between taking to pieces and putting together arises from actual operation on material things. This origin of the metaphor involved in 'analysis' and 'synthesis' has reacted and still reacts injuriously on our conceptions of intellectual processes. In mechanical operations we cannot pull to pieces and put together the same thing by the same act, and which of the two we can do is determined by the material handed to us. If a thing is complete already, we cannot put it together any further; the only alternative then open to us, as between these two processes, is to pull it to pieces; and so *vice versa*. But this feature of material operation cannot be transferred to thought, and for this reason, that the essence of thought is to show the process in the result, and exhibit each as necessary to the other. Therefore, if we construct in thought, the materials out of which we construct have not lost their separateness when the fabric is finished; the fabric as it is still issues from them as they were; if not, we have dropped a link, and our construction is unwarranted. The synthesis, one might say, is based on the analysis;

but this would ascribe a false priority, because the fragments supplied to us only *become* an analysis as the synthesis, which relates them to a whole, progresses. Apart from the synthesis they are mere fragments, and therefore are not an analysis of anything. The workman who puts together the parts of a watch has first the handful of wheels and springs, and then the completed watch; he cannot have both at once, and in as far as he has one he has not the other. Moreover, when he has made the watch the wheels and springs are together and are not separate, nor are they separable consistently with the existence of the watch. Synthesis in this sphere is incompatible with analysis, and *vice versa*. But a man who wishes in thought or calculation to construct any instrument out of parts has a very different task. Every element of the handful of parts must have its place and functions clearly retained in the intelligence which constructs the whole; for the whole, as a whole of intellectual synthesis, exists no longer than its parts are clearly apprehended in their relations. 'Yes,' it may be said, 'but the distinction must remain that even in thought you may *either* begin by considering detached wheels, etc., and finding out how they must act in the watch, *or* by looking at a watch and detecting, within its completed system, the separate parts and their relations. The former process is synthesis, the latter analysis.'

This is true so far as judgment or inference is an activity in time, and includes within itself a transition in time. In so far as it has this character, the process of thought can simulate or share the characteristics of material operation. But this does not affect the internal nature of judgment, as I have pointed out in discussing its temporal character. The question is not whether you begin with the whole or with the parts, but merely what sort of whole and what sort of parts you begin with. Given an escapement wheel, I may chance even to be ignorant that it belongs to a watch at all; but none the less I judge of it as a part in a whole, which whole I can at first only think

of, perhaps, as 'some piece of mechanism that depends on a catch playing into a delicately toothed wheel.' The further intellectual construction of this mechanism and the ultimate definition of it as a watch, is, according to the views of the passage just referred to, not a transition from *S* to *P*, but a transition from the judgment *s–p* to the judgment *S–P*. We therefore find analysis no less than synthesis to be the internal essence of every minutest section of the judgment or inference in question. In the same way, if a watch is put into my hand with instructions to find out what makes it go as it does, I have primarily a thing in space as the given whole, and indefinite wheels, springs, etc. (which as yet I cannot distinguish by position or characteristic shape) as given parts. No doubt *in space* all the parts which I shall need to learn are given *in position within* the whole, and so we tend to describe the problem as one of analysis, in contrast to the other (in which I had to find out or imagine the position of the parts in the whole) as synthesis; and these titles serve well enough as superficial descriptions of certain cases to which judgment and inference are applied—not of *any* judgment or inference as such. But the whole is not, in the latter case any more than in the former, given as an intelligible machine, nor are the parts given within the whole of knowledge because they are within the whole of space. In other words, to see the escapement wheel lying inside the watch does *not* 'give' me this wheel as a part of a mechanical arrangement; to know it as a part of *such* a whole I must understand it; and in understanding it, i. e. in my analysis, perform the synthesis of the watch as a definite mechanical contrivance.

Therefore not only is every judgment both analytic and synthetic, but it is analytic only as far as it is synthetic. It can only be called analytic or synthetic *par excellence* if, by the same confusion that causes the judgment to be regarded as a transition from *S* to *P*, we consider the joint analysis and synthesis of one whole as the analysis or synthesis of another; because in that case we

seem to have a fixed and given whole, and to predicate of it nothing but parts, or *vice versa*. In this confusion there is an element of truth. Though s must become S when p becomes P, yet s has continued identity with S and p with P, and therefore the transition in time from s–p to S–P does all that could be done by the unreal transition from s to P. Present me with a pattern s which is a tissue of intersecting curves p, and when I have analysed it into the thistle design P, the pattern s is transformed to my eye into a distinct and beautiful design S; but S is the same that was s, and in that sense we have connected s with P, and we may represent P as the analysis of s, only not forgetting that it is the synthesis of S which is the same as s, and that therefore in predicating P of s we *ipso facto* transform s into S. And thus the complete understanding of a watch as a mechanical system, expressed in the joint analysis and synthesis S–P, may be accepted as happening to involve, *par excellence*, *either* the intellectual analysis of the watch as a given whole in space s, *or* the intellectual synthesis of the watch out of given separate parts in space s_1, s_2, s_3, etc. The given whole, or given parts, can be thus allowed to pass as merely whole, or merely parts, because they are not respectively whole and parts in the sense contemplated by the judgment S–P, and therefore it does not press home their relation to one another. The watch seems to be from the first a ready-made whole, a round thing s in space, which can only be analysed, and not constructed, by the judgment S–P. But it *is* further constructed, not as a round thing in space, but as a mechanical system, by means of that judgment.

CHAPTER II.

Quality and Comparison.

I NOW turn to examine specific types of judgment; but in doing so, I must beg leave to remind the reader of the principle which I have laid down as governing any enquiry into a continuous development[1]. What we wish to master is the nature of a process, the scientific history of a function. To do this, we must of course study and arrange its detailed manifestations; mere generalities are valueless. But we need not be disheartened if our subdivisions and specific names are different here and there from those adopted by better authorities, nor even by the possibility (which can hardly be absent from a highly detailed treatment) that we may misinterpret some phase of evolution, or lay down some inconvenient demarcation. If the main problem is thoroughly faced, and the analysis of some chief typical forms accurately conducted, the reader will be in a position to correct blunders and to supply omissions by the light of the knowledge so gained. If we can help him to sound principles and practice of morphology, he will make short work of particular varieties of type.

Judgment, we have seen, is, speaking generally, the intellectual function which defines reality by significant ideas, and in so doing affirms the reality of those ideas. I use the term 'define,' because to define implies something given which is to be defined; and it is an essential of the act of Judgment that it always refers to a Reality which goes beyond and is independent of the act itself.

The Judgment of Quality.

1. We will now look at the judgment in its simplest form, which I have ventured to call the Judgment of Quality, and

[1] Vid. Introduction, p. 16.

which, with its immediate sequel, the Judgment of Comparison, finds linguistic expression in the Interjectional or Impersonal Proposition.

Meaning of Quality.

i. By Quality I understand, not all attributes without distinction, but the unanalysed content of any idea, when treated, in its unanalysed simplicity, as a feature of reality. It may be that all qualities are capable of being analysed into relations; but for our present purpose the question is not whether a quality *can be*, but whether it *is* so analysed. Even the diagrams familiar to us in Euclid, which exist for the very purpose of being analysed, have each its peculiar look or effect, lopsided or symmetrical, solid or slender, circular or bristling with angles. Qualities of shape, however, are a rule quickly analysed into relations of proportion, so that the commonly cited phenomena of colour and sound give better instances for our purpose, while perceptions which are named, like softness and sweetness, with some reference to pleasure and pain, are the best instances of all. It might indeed be suggested as a definition of quality that it is that aspect of any perception or idea in which it gives rise to pleasure or pain.

Judgment of Quality proper.

ii. The Qualitative Judgment proper affirms a nearly simple content directly of present Reality. An absolutely simple content is indeed an impossibility; every 'red' or 'sweet' or 'pleasant' belongs to some context and includes some differences. But, as I have attempted to explain in the last paragraph, a qualitative content is very nearly simple. The context which makes its difference is the context for the sake of which we affirm it, and is thus presupposed, and not itself affirmed as a further complication. If I exclaim 'How hot!' I do so because the weather or the room is hot, or perhaps if I am feverish, because I am hot for no obvious reason. In all these, no doubt, the content 'hot' belongs to something; it is not isolated from the varied surroundings of my position, but exists in and extends over some of them. But I affirm it without specification, or rather as a first effort to make specification, of my position

and surroundings in general, and neglect to analyse its relations, or only analyse by implying that it has some relation or other.

Thus much for the Predication. As for the subject of a pure Qualitative Judgment, there is *prima facie* no assignable subject within the judgment. No ideas are employed to limit the aspect of reality to which the predication refers. The whole of what is perceived at the moment, or more probably some unspecified aspect of it or element within it, is the subject, and it is of this that the content is affirmed. By 'unspecified,' I do not merely mean unspecified in words spoken aloud, but undefined by any such act of consciousness as employs symbolic ideas and tends to call up words. But if thus unspecified, how can the subject be indicated, limited, or selected? I answer, simply by the concentration upon it of perception or attention, the exclusive gaze which might be represented by pointing with the finger, and which, though it *has* limits, is definitely aware of none. In this sense, confining what is 'present to perception' within the limits of what more especially arrests attention and is taken as 'This' *par excellence*, we might say that the subject of the Qualitative Judgment is always the whole of what is present to perception.

The best illustrations of this rudimentary Judgment are drawn from significant Interjections, or from significant phrases used as Interjections. A distinction must be observed between the true Interjection [1], the outcry which relieves the urgency of feeling, and the affirmation which refers the content of feeling as a quality to the surroundings that evoke it. The cry of an animal is often significant for us; it tells us what the animal feels, and why; but we do not therefore reckon it as the expression of a judgment. What makes the judgment is the idea that exists in our minds and yet that only has truth as referred to Reality. And therefore if we doubt whether we have a judgment before us, we should ask if it is anything that could intelligibly be denied.

[1] Cp. Lotze, Logik, sect. 48.

It is impossible to *deny* the animal's mere expression of its feeling; and although we may see a reason for its feeling which we know to be an illusion (e.g. if a dog barks joyfully in expectation of being taken out, when he is not going to be), yet there is nothing which we can deny unless we can suppose that this illusion exists in the animal's mind as an idea distinguished from and referred to reality. *If* we could believe this to be so, we should have to admit that the animal judges. But short of this, there is nothing to deny. The dog sees me take my hat and stick, he has a set of mental images connected with going out, and he expresses pleasure. I cannot deny that he has the images or that they give him pleasure. It would be only if he could take these images as standing for something other than themselves, and so distinguish their meaning, a future event in reality, from their existence, as present images in the mind, that anything could possibly arise which I could intelligibly deny. The ideas used in judgment must exist before they can be denied, and therefore their existence cannot be denied, but only the affirmation of their meaning[1].

Coming to human interjections, we might think that 'Alas!' characterises the present as grievous; and it is certainly sometimes *answered*, though hardly denied. But the answer, even if it takes the form of a denial, is usually rather prohibitive (imperative) than negative; though if self-deception or hypocrisy are suspected, 'alas!' may be interpreted as 'I am sorry,' and in that sense denied. The distinction to be kept in mind is here one degree more subtle than in the last case, for the objective content of the judgment is the fact of a feeling in the mind of the person who judges. Thus we have, if 'alas!' is a true interjection, the emotion of grief present in the mind of the person,

[1] These remarks are made purely for the sake of illustration. I have not the least prejudice against admitting that animals can judge, if the admission can be warranted by fact, and does not involve truncating the theory of judgment. Domestic animals certainly *seem* to use the imperative, i. e. to insist on the realisation of their ideas. Cp. Bradley, Principles of Logic, p. 33.

which merely forces him to utterance by way of relief. But if it is to be taken as a judgment, then we have in any case the symbolic idea of sorrow, *existing* in psychical images, but having its meaning beyond them, and a reference of this meaning to the present perceived being of the person in question. And above all this, if the judgment is true, there must be, as before, the actual felt emotion of sorrow, though if it is false, this element of the complication is absent. It is possible that this peculiar complication, of the idea with the actual feeling behind it, is responsible for the curious duplication of personality which is sometimes experienced in protracted pain or anxiety. The person whom we analyse and judge seems other than the person who all through the process has the feelings which are being analysed, or rather are forcing their disagreeable peculiarities on our attention. 'If *I* were suffering so, how horrible it would be,' we repeat to ourselves. Just as the complementary image comes between our eyes and the sun, so the idea of our feeling comes as the object of knowledge between us and the feeling itself, which remains in the background and resists our successive efforts to include it in an adequate idea. The sufferer remains to us distinct from the person whose suffering we conceive and affirm.

However this may be, when we come to such quasi-interjectional expressions as 'Bad!' 'How ugly!' 'Such pain!' 'Oh horrible!' we are unquestionably dealing with judgments.

The Impersonal Proposition is also a suggestive counterpart of the judgments in question, which have even been treated as Impersonal Judgments. But the impersonal form of sentence has become in developed language so purely a grammatical fiction, that it no longer illustrates with special appropriateness any one type of assertion; although it exhibits a certain coincidence with the range of the concrete existential or singular categorical judgment.

A few instances however occur to us at once—and philology might be able to furnish more—of impersonal sentences that really seem to have stood for judgments

whose subjects were not especially designated by means of ideas, but were accepted as merely the given in perception. Such may be 'Methought,' 'Him list,' 'Mir traümt's[1],' 'Es trieb mich,' 'Taedet,' 'piget,' etc., 'It rains,' 'es macht heiss,' ὕει. As, in the plastic Greek imagination, Athene may suggest a man's thought, and the actual Dream stand over him in sleep, so, it would seem, in the beaten track of language, the thought and the dream are simply referred to 'it' or to 'something;' to the present reality or to an indefinite element within it. Though the formed verb presupposes a distinct reference of ideal contents to rea subjects, yet the habitual use of expressions in which this reference is blunted and neutralised, testifies to a survival, in certain preeminently obscure relations, of a rudimentary type of judgment. This, I think, is the only connection that we can safely assume between the Judgment of Quality and the Impersonal Proposition.

The Qualitative Judgment is the germ and simplest case of the Perceptive Judgment. Perception is a wide word, including, as frequently used, any so-called immediate apprehension; even that, for instance, by which we are supposed to see the necessary truth of one of Euclid's axioms. But if we are to give the term a distinctive logical meaning, we should do well to restrict it to so-called immediate apprehension when dealing with the portion of reality which is in contact with the individual through the senses. Perception thus defined deals primarily with what is present, but extends it by ideas which go beyond the present. When we recognise a man and call him by name, we are said to 'see who he is,' i.e. to perceive. In this case our perception is expressed by an idea that goes a

[1] In Greek, a conservative though flexible language, 'I dreamt,' is never, so far as I know, impersonally rendered: but on the other hand, in Homer the dream is personified. The principle is the same in so far as my dream is not referred to me as my act. Indeed the coincidence is curious with the view of those who have held that the subject of an impersonal proposition is the content of the verb itself as in 'the rain it raineth every day.' It is much the same to say 'Es traümte mir' and to say 'A dream came to me.'

long way beyond the present and brings in the man's entire personality.

The Qualitative Judgment does *not* differ from the judgment which recognises an individual, by being shut up within a minute interval of present space or time. It is not minuteness of extension or of duration that distinguishes the reference of this simplest case of the perceptive judgment; the qualitative affirmation may deal with what *is* really a considerable area of space or interval of time. The distinction is not one of magnitude, but of definiteness. There is always a risk of construing the absence of quantitative determinateness into determinate minuteness of quantity. This is just what we want to avoid. The qualitative judgment knows nothing at all of duration or of extension, and can have no specified individual for its subject. It is thus confined within the given presentation in so far as the universality, whether abstract or concrete, is absent that alone could extend it beyond. The Reality which is the subject is the given as given, not as a universal that reaches before and after; the content of the predication includes no negative element, summarises in itself no diverse manifestations, and thus neither refers to anything beyond the present, nor in any specific way to the present itself. It is attached to the present by the mere fact of its actual reference to presentation, not by anything within its explicit content. The first specification, the first establishment of an identity that can be called by a name, is the work of this judgment, and is not presupposed by it. We must take it, I think, after the discussions of the Introduction, that the establishment of a name—a permanent identical symbol of a meaning—must *on the whole* have coincided with the establishment of meanings as such, distinct from psychical occurrences, and capable of being referred to reality. I have attempted in the discussions in question to qualify the rashness of this unverifiable[1] his-

[1] Of course there can be verification by analogy; and it is hard to draw the line between this and actual verification. The characteristic cries of animals

torical allegation, by pointing out that the two co-ordinate processes—the constitution of symbolic ideas and of linguistic symbols—must be regarded as processes of gradual and unconscious adaptation, widely differing from the methodical extension of nomenclature according to modern ideas. But the logical track is the same, whether the historical evolution is quick or slow, conscious or unconscious.

Perception as above defined would include two species which have been called respectively the 'Analytic' and the 'Synthetic' judgments of sense. If these distinctions are to be seriously treated, and we are to speak of any judgments as merely analysing a presentation of sense, without going beyond what is given within it, then, I think, we must identify the Analytic Judgment of sense with the Judgment of Quality. It appears to me quite idle to treat a description of an ordinary scene, such as 'The blacksmith is at his forge mending the ploughshare,' as a case of a judgment confined within *present* perception. Every element of the description is a concrete individual, including innumerable differences, involving elaborate categories, and extending indefinitely into past and future. If ever there was a constructive or synthetic judgment, this is one. It would surely be more appropriate to treat these common perceptions, which we deal with lower down, as Synthetic judgments of sense, because they interpret what is given by ideal contents that go beyond it. And then we might reserve the title 'Analytic Judgments of sense' or 'Judgments of Quality' for the activities represented by the Interjectional and Impersonal propositions of which I have spoken, and the true Demonstrative propositions of which I shall speak below.

The difficulty of identifying simple forms of judgment is intensified for modern reflection by the definite and diverse articulation of the elements of modern speech. The lan-

and children have significance for us, and we cannot suppose that they do not react upon the intelligence of those who utter them. It would be far easier to understand how animals should acquire language, if, like children, they did so in fact, than it is to understand how they stop short of it.

guages which embody the reflective thought of Europe, both ancient and modern, resist the expression of elementary perception in two ways. First, for a germinal thought we need a germinal word. But the languages which mould our ideas have no germinal words. Every word, in the language of European culture, is a particular 'part of speech.' That is to say, it is adapted to fulfil some one function in a sentence, whether substantive, verb, pronoun, or conjunction, and, if used alone, has an air of incompleteness which forces us to 'understand' supplementary words. The existence of the Judgment of Quality is but slightly corroborated by the fact that a single word often conveys a judgment. Many such single words are conventional symbols for quite definite sentences. But the judgment of which we have been speaking corresponds to a whole sentence in the bud, with its differences unevolved. How far philology could furnish authentic representations of the sentence in such a stage—words which are not '*parts* of speech,' but entire though undifferentiated *units* of speech—it is beyond the limits of the present work to enquire. Even the verb of ancient Greek or Latin, which required no supplementary pronoun to represent its subject, is one degree more appropriate for the purpose than any element of modern speech.

And the second difficulty is really a case of the first. Most judgments are expressed by help of a verb, and if we employ a substantive or adjective alone, it urges us to 'understand' a verb. But a verb is in our languages above all things a *tense*; and for a rudimentary judgment like the judgment of Quality, a tense is exactly what we do not want, least of all the elaborate duration-tense of the present (τρέχει, amat, 'he is acting'). We want to affirm neither duration nor yet point of time; we simply want to qualify the given by a content, without specific limitation or extension. It is true that the logical present, the absolute present of the universal judgment, marks no limitation of time, and it depends on the nature of the content involved

whether universality of time as an infinite series is asserted in such a case. But whether it claims universality in time or by negation of time, such a judgment implies the conception of time as an abstract whole and is posterior to this conception, while the reference of which we are speaking is prior to the origin of the systematic idea of time.

These properties of developed language,—and prior to developed language it would scarcely be possible to have analytical reflection,—may be compensated, but cannot be cancelled. The fact that sometimes thought is behind language, and at other times struggles to pass it (it would be hazardous to complete the antithesis by saying that thought can really outstrip speech) is a fruitful source of misinterpretation. Children learning to speak, or savages learning a European tongue, are like the wizard's apprentice uttering a spell; they are incapable of grasping the significance or controlling the effect of their words. And all human beings perpetually oscillate between limits, different in every case, on the scale of intelligence; for not only is the student's or politician's world of thought very different from that of an illiterate man, but every man varies in the level of his intelligence according to momentary conditions of interest and capacity. The same difficulties of interpretation which are found by a student in the speech of a child or Anglicised savage, subsist in a less degree as between every man and every other, and as between every man and himself.

Up to this point the constituent elements of the Judgment have been naked before us. There was the Subject,—the actual contact in which reality pressed upon our sense-perception,—and there was the significant idea by which we defined it. It is this case that affords the strongest support to the view which denies all meaning to the distinction of Subject and Predicate, as a distinction of elements within a judgment. The Reality to which we ascribe the predicate is undoubtedly self-existent; it is not

merely in my mind or in my act of judgment; if it were, the judgment would only be a game with my ideas. It is well to make this clear in the case before us, for in the later forms of the judgment it will be much disguised. Still the reality which attracts my concentrated attention is also within my act of judgment; it is not even the whole reality present to my perception; still less of course the whole self-existent Reality which I dimly presuppose. The immediate subject of the judgment is a mere aspect, too indefinite to be described by explicit ideas except in as far as the qualitative predication imposes a first specification upon it. *This* Reality *is* in my judgment; it is the point at which the actual world impinges upon my consciousness as real, and it is only by judging with reference to this point that I can refer the ideal content before my mind to the whole of reality which I at once believe to exist, and am attempting to construct. The Subject is both in and out of the Judgment, as Reality is both in and out of my consciousness.

The demonstrative Judgment.

iii. We have now to consider a slightly more definite type of judgment, which we may still rank among the judgments of quality, although we can detect in it the beginning of a further growth.

When we say, '*This* is hot,' '*Now* it is raining,' '*Here* it is dark,' the demonstrative pronoun or particle designates the point in given Reality to which the affirmed content is to refer. The point is designated, but seems, *prima facie*, not to be described. The demonstrative has a meaning, no doubt, but its meaning seems to consist of a mere reference to what is presented before perception, and therefore does not seem to introduce any abstract limitation that qualifies the given subject. Compare, for instance, 'This is hot' with 'This metal is hot.' The latter judgment may possibly be met with 'This is not metal at all,' and by such a reply the judgment is cut in two, and the more significant half becomes a conditional assertion whose condition does not apply to the 'this' in question. But 'This' alone is on a different footing. You cannot say, 'There is no *this* at

all.' There is always a *this*, as there is always a *that*; and the same applies to *here*, *there*, *now*, and *then*.

One of these demonstratives indeed appears at once to take us over a boundary. 'Then' requires a past or future tense in the predication; and in referring to the past or future we get beyond analysis of the present, which is the province of the analytic judgment of sense. The problem is one of real importance, but its point is not where we are most likely to look for it. It is not that the Judgment of quality refers to a point of time, and that 'then' takes us outside this point; it is that the Judgment of quality is prior to the idea of duration, and that we have now introduced the idea of duration definitely into the subject. The effect on tense, which happens to be the vehicle of predication, produced by taking 'then' as the subject, calls our attention to the fact that every present includes a past. The contrast of 'here' and 'there,' not happening to affect the verb, did not force on our notice the equally real universality of the present in space. Every 'here' is made up of 'there's' as every 'now' is made up of 'then's.' And thus in designating a given subject as 'now' or 'here,' we have unawares included in the subject a 'then' and 'there,' and by introducing universals of space and time have set our faces to leave the region of the qualitative judgment. The demonstratives stand for ideas, and it is therefore *through ideas* that in the judgments now in question we refer to reality. But the demonstratives have the peculiarity that *their application* cannot be denied, as can that of a determinate idea such as metal, and therefore, though they characterise the given Reality as appearing in space or time, yet they can specify no nexus, introduce no condition, which may be absent in fact, and through its absence may save the judgment from falsity by rendering it inapplicable. If heat is not present in the 'this' to which it is ascribed, the judgment 'this is hot' is false without reserve; but if to 'this' we add 'metal' then the absence in fact of the condition 'metal' makes the whole judgment

ambiguous and inapplicable. Thus we have in the demonstrative judgment of quality, as in the simple or pure judgment of quality, a perfectly categorical judgment; the Subject must, in its nature, exist, and the Predication must therefore be alleged to hold good of actual existence. It is noteworthy that of this perfectly categorical judgment we cannot say whether the existence of the Subject is affirmed or presupposed. Where we are dealing with the given *qua* given, the difference between affirmation and presupposition has not emerged.

The Judgment of Comparison.

2. The contrast between 'now' and 'then' suggests to us the consideration of such judgments as are expressed by 'Now it hurts less than then,' 'This is redder than that,' 'Here it is hotter than there.' The form of these judgments indicates as their appropriate title the Comparative judgment, or the Judgment of Comparison. They arise naturally out of the Demonstrative judgment of quality, because, as we saw in the case of 'now' and 'then,' it is impossible to prevent the present subject from revealing differences within itself. 'This,' as more clearly defined, will display itself as a part, 'not-that' within 'this and that,' 'now' as a part 'not-then' within 'now and then,' 'here' as a part 'not-there' within 'here and there.' The whole, when thus resolved, displays differences of quality between its parts, or rather the given reality reveals itself as a whole for the first time when it breaks up into parts united by an identical but varying quality. Even if we forget that the 'this' and 'that' ever entered into a single whole, yet the identical quality because of which we compare them contains in itself the essential of the comparative judgment, viz. the *explicit recognition* of difference in identity. 'Redder,' 'hotter,' 'less painful,' are terms that go beyond mere quality by introducing the conception of more and less, that is to say, the beginning of quantity. I give instances, bracketing the explanatory words which would be superfluous in presence of direct perception, and which belong to a higher level of judgment than that which we are discussing. 'This

[paper] is green, and this [part of it] is lighter green than that.' 'Now [all to-day] it[1] hurts less than it did [yesterday]; but [just] now it hurts more than it did [a moment ago].' But in cases like these we are apt not to notice that we are predicating differences within a single identity, the green paper, or the whole of to-day; though we must be aware that we imply them in the comparison of quality. And therefore, having pointed out the underlying character of such a simple analysis as the above, I will pass at once to a case which is one degree more complex, but which displays the essence of comparison beyond possibility of mistake. I refer to the case in which a given whole of perception designated by one demonstrative has parts distinguished within it by means of the others, and differences assigned to it conditionally upon these distinctions. There is no difference of principle between defining 'this,' within 'this and that,' and defining it within 'here and there.' The only advantage is that a demonstrative of another kind is more readily taken as a condition, while one of the same kind is apt to be understood as a jump to a wholly new subject. We will therefore merely change the *parts*, which might be new and substantive wholes, into *conditions*. '*This* is redder now than it was then.' 'This is hotter in this part than in that.' 'This [green paper] is lighter here [in this part of it] than there [in that].' These instances clearly show the primary datum revealing itself as a whole with parts distinct yet bound together by a common quality.

Quantitative Comparison.

i. Let us now examine the essential nature of the comparative judgment in one of the above instances. It is not my intention to enter upon the niceties of quantitative comparison at the present stage.

We will take the instance, 'This is redder now than it was then;' or in the simpler form, 'This is redder than it was.' We will take the Predication first, and then consider its reactio nupon the subject.

[1] The 'it' in this instance is on the verge of introducing an identical subject. I did not however mean it to stand as a definite subject, but merely as the grammatical complement of the impersonal verbs.

That which is redder is also red. The red and redder are both red, and yet differ from each other, not, or not merely, in other ways, as in time or place, but in respect of their redness. It has been sufficiently insisted on that there cannot be difference without some identity, as for instance a red and green surface are identical in respect of reflecting light. But these, though the same in as far as they reflect light, are not the same in the light which they reflect. There is a break between the two colours, considered as colours [1], which nothing can bridge, and the immediate perception of their discontinuity supplies the terms which indicate the difference between them. The surfaces which are both red, but one redder than the other, are separated by no such break. If one changes into the other, it does not cease to display the same quality that it displayed before. But a quality that changes, and yet remains the same quality, has passed into quantity, which might be defined as difference, not merely *in* identity as its meeting point, but consisting *of* identity as its material.

Thus the fundamental identity and difference of judgment are specified by the comparative judgment as whole and parts in the simplest form of that relation: viz. the form in which the whole differs from any part by an interval which consists of other homogeneous parts. Parts in this sense differ from units only by lack of precise comparison; but *precise* comparison is posterior to the conception of a whole, of which we are just considering the first establishment. We do not measure or count until we know of some totality that requires definition by these processes.

The reaction of comparison upon a simple subject indicated by a demonstrative, that is, on a mere spot or point upon which perception is concentrated, is an essential step towards the recognition of an individual totality. The present of space or time is as we saw in its nature con-

[1] It is possible that, considered as amounts of light, red or green may share a continuous element and so have quantitative relation. If so, this is another case in point. For the difference is then in respect of the characteristic which forms the identity.

tinuous. Therefore the spot or point on which perception is fixed, and which we indicate perhaps by 'this,' will undoubtedly exhibit differences under analysis. Such analysis is brought to bear by the judgment of Comparison. The spot or point [1] in which a change of degree is observed forces itself on by that fact from being a mere spot on which the eye is fixed to the first stage of individuality as a synthesis of differences. Change is not necessary to this result, though negation in some form is. The observation of parts differing in degree within the spot which we have in view is as effective for the purpose as the detection of succession within the time which we call 'now.' The mere spot fixed by perception begins under such analysis to assume the character of a Thing; and by a parallel process, the distinctions of Time and Space begin to emerge as parts within homogeneous systems.

It is obvious that such a point in the evolution of thought would correspond to the first distinction of Noun, Finite Verb with Tense system, and the more elaborate spatial and temporal adverbs and prepositions. But it would not be fair to test the correspondence strictly by negative instances. Language fits thought as a very loose glove; and if it were the case that we could find several languages in which our familiar parts of speech, more especially the tense system, do not exist, we should still no doubt find that the distinctions, whose origin we are examining, are represented in some other way than by linguistic signs, or are thought even if not represented. It would be ridiculous to contend that the Chinese do not think of self-identical and independent things, even if it is true that their language has no special class of nouns substantive. Nevertheless, the contrast of

[1] It is hard to escape the dangerous pitfall of speaking as though there were no perception but sight, and therefore as if the germ of the judgment were always fixation of the look in space. The focus of attention may operate through any sense, and *is* characterised at any moment by that identity which the judgment makes explicit. But the identity is referred in rudimentary judgment not to a special content as subject but to what could only be paraphrased as 'That which engrosses my attention,' the present feeling which the judgment determines into thought.

development between different languages has or has had its meaning; and it appears to me absolutely impossible that a people *whose sole language* was Hebrew could have had the accurate consciousness of time as a system which came easily to the Greeks and Romans of the classical age. I believe, indeed, that the origin of the Aryan tense-system is not beyond the ken of philology, and that its probable history reveals an evolution much like that which has been here suggested—a transition from simple unspecified reference, to reference differentiated by a temporal system.

'This,' then, as the subject of a continuous Quality including differences tends to acquire an individual name. I have pointed out in the Introduction that the process of Naming in a world distinctly organised by knowledge cannot be that which belongs to the unreflective epochs of thought. A natural name must be a petrified description. The linguistic element which stands for the content of the Judgment of Quality is already a name. And some such element, in the simplest case perhaps that element itself, will emerge in later forms as a description of the newly distinguished individual, which in the Judgment of Quality is only known as 'this.' 'This red (leaf) is redder than it was.' And when the individual is once revealed as a whole with parts by this judgment of Comparison or synthetic judgment of sense, the ascription of other differences to it cannot but follow. It seems obvious that an adjectival appellation, or at least an appellation of unspecified grammatical class, would come first, and the hardening into a substantive be a later process. I incline to think that the hardening of a description by usage, and the isolation of its elements by employment in different judgments, must have been the real and natural process of naming.

Comparison in Space and Time.

ii. It is evident that judgments which assert distinctions of Space and Time, without proceeding to measurement by units, must be ranked among comparative judgments, or, as these might otherwise be called, judgments of continuous quality. It is not the business of Logic to analyse

the means by which the consciousness of extension or succession is obtained. Logic only deals with the nature of such a consciousness, and not with its psychical genesis. But we cannot entertain a doubt that position in Time or Space can only be indicated to consciousness by qualitative marks that fall outside the content which is perceived as in Time and Space. Our inability, in many or most cases, to detect these marks by immediate observation (I have never been able to analyse my seemingly direct perception of the quarter from which a sound comes), cannot, I think, outweigh the impossibility of showing other means by which the eye can judge distance, the ear direction, and the memory recal a series in its serial order, and no other.

The only logical importance of this psychological analysis lies in its confirmation of the idea, suggested by the facts of language and the very nature of quantity, that Space and Time must imply qualitative discrimination as an element of quantitative comparison. Nearer and further must be qualitatively distinct spatial perceptions, as red and redder are qualitatively distinct chromatic perceptions. Thus, the abstract totalities of Space and Time have their germ in comparisons effected by perception co-ordinate with the perception of continuous quality and of its differences.

But the demonstrative judgments have forced upon our notice a further and peculiar distinction within space and time as continuous qualities, which is known in space as difference of direction, and in time as difference of past and future. 'Nearer' and 'further' are different spatial perceptions; and it is possible that 'this' and 'that' may be naturally equivalent to 'nearer' and further,' as 'here' and 'there' must be, or must soon have become[1]. But besides 'this' and 'that' we have in space the distinction of 'that' and 'that,' 'there' and 'there,' just as in time besides 'now' and 'then' we have 'then' and 'then'—a distinction which may

[1] Even if, prior to a spatial distinction recognised as such, there may have been a less defined distinction as between 'by me' and 'not by me.'

apply to points equally removed in past and future, and therefore cannot be reduced to quantity, i. e. degree of remoteness. 'That' and 'that,' 'there' and 'there,' imply no difference of remoteness, nor indeed do 'this' and 'that' necessarily do so.

All these may just as well mean on the right hand and on the left as nearer and further. They must indeed *be* comparable in distance, but it need not be distance that furnishes the distinction between them. With other qualities the case is different. There cannot be two different reds that match; all reds that match, i. e. that are 'equal,' are the same. And if there can be two or more different musical sounds that have the same pitch, this is because the distinction between them is one of kind, not of simple quality, because, that is, they are composite perceptions which are estimated with reference to one element within them taken as dominant or essential.

Thus it seems that (1) Space and Time appear in the germ as mere qualities whose continuity is displayed in the judgment of comparison like that of any other qualities. If apprehension of Space and Time really depends on 'local' and 'temporal signs,' we must suppose that the peculiar definite externality which characterises extension could only appear by degrees, and that perception must have been transformed from perception of contents *plus* local signs, to perception of contents *arrayed in extension by means of* local signs, that the *logical* character of spatial perception, its continuity and homogeneous differences, must have been present from the first in any system of apprehension which could develope into our spatial world. The judgment of continuous quality admits of this. And (2) the distinctions which first present themselves within a given spatial or temporal perception are not simply and solely differences of quantity, though in time more so than in space, and in both capable of quantitative expression. They are more analogous to differences of kind. We must therefore take the spatial and temporal demonstratives,

apart from explicit quantitative comparison in space and time, as in themselves comparative contents involving continuous quality.

The divergence from the main progression of the judgment, by which space and time are erected into totalities having a special structure of their own and a peculiar mode of existence, must be taken as beginning with the resolution of a given 'now' and 'here' in the judgment of comparison. In this resolution we have the two grades, corresponding to distinctions of direction, or to the distinction of past and future, and to quantity respectively; first that in which 'this' and 'that' may be e.g. to left and right (not nearer and further), where the spatial comparison is implied rather than expressed, corresponding to the judgment, 'This is red, and that is green;' and, secondly, that in which a true spatial comparison is introduced into the content, as in 'This is nearer than that,' which is analogous to 'This is redder than that.'

So-called Qualitative Comparison.

iii. Under the head of Comparison it is usual to treat of like and different in kind, as co-ordinate with more and less. But it is to be observed that such a co-ordination is not accurate. Mere qualities, as such, are disparate, incomparable with each other. The judgment of quality pure and simple, as we have seen, excludes comparison. This is red, this is black, this is golden, this is sweet, this is sour. These are successive and isolated judgments of quality; and the semblance of comparison which they now bear is due exclusively to the advanced point of thought at which language places us to begin with.

Comparison of degree, as we have seen, includes difference or elementary negation within the limits of a single quality, but the differences themselves, in regard to the aspect which makes them distinct, remain disparate or incomparable. In other words, every part of a quantitative whole is distinguished by a peculiar quality as well as united with the rest by an identity of quality. Every shade of red, besides being a degree of red in general, is also a particular hue and produces a distinct impression. Every perception of

warmth is qualitatively peculiar, and often it is not without an effort that we can recognise the character in respect of which it can increase or decrease. Every inch in a yard measure, every cannon ball in a heap, is thus distinguished; and if it were not so, the parts would have no stability and the quantitative whole would cease to exist.

We therefore are driven to conclude that quantitative comparison is not *prima facie* co-ordinate with qualitative, but rather stands in its place as the *effect of comparison on quality*, which so far as comparable *becomes quantity*, and so far as incomparable furnishes the distinction of parts essential to the quantitative whole. It is with this latter aspect in which qualities are incomparable that qualitative comparison as such must be connected. It is thus, *prima facie*, comparison of the incomparable. Any two shades of red, regarded as shades of red, are respectively more and less. But they must also be, as we have insisted, *different reds*, and if regarded simply thus are pronounced incomparable as a result of comparison. If we pass, as we can, by slow transitions, along the complete solar spectrum, comparing each colour with that which formed our starting-point, we shall arrive first at differences which may, and then at differences which must, be thus regarded. The difference between red and green, for instance, is not to ordinary perception a difference in the same quality; and if it can become measurable, can only become so by reference to an identical quality, such as brightness of illumination, which falls outside the peculiarities of red and green as such.

I believe that it is futile to attempt the measurement of difference except in respect of a continuous quality. And the mere affirmation of difference, without the attempt to measure, appears to me absolutely devoid of meaning. The mere judgment, 'These two colours,—these two sounds,—or, these two perceptions (a colour and a sound), are different,' is an imperfect and unreal judgment, which

in this form, and apart from a meaning which I shall explain below, is as I believe to be found nowhere but in logical text-books. It may best be considered as an incomplete quantitative comparison, in which the parts are distinguished, but their place in a continuous whole has proved impossible to determine. In this sense, the mere judgment of difference would mark the initial effort of quantitative comparison. Such a relation is illustrated by the well-known fact that qualitative difference, e.g. between two musical notes, is perceptible before its quantitative nature (their relative pitch) is ascertained. *Such* a judgment of qualitative difference may be regarded as a first determination of quantity; for its point is merely to deny identity of quality, and in matters of simple quality to be identical is to be equal and *vice versa*. In this sense the judgment of qualitative difference, such a judgment as we make when we see that two colours do not match, is an aspect of the initial stage of quantitative comparison.

But another judgment of sameness or difference, which it is almost impossible to avoid confusing with the above, has its true place in classification and analogical inference, and, if explained as mere qualitative comparison, is an unreal fiction. Such judgments are:—'These two instruments are not in tune'; 'Gladstone and Chamberlain are very different men'; 'That victory is uncommonly like a defeat'; 'The globe-flower is just like a hellebore, only it is yellow.' Here we are not speaking of an immediate qualitative identity and difference, but of essential and dominant qualities or rather attributes, in other words of differences valued by a presupposed standard or purpose. The idea of a standard involves the idea of kind, and kind goes beyond quality. Therefore, we come to a conclusion which I think frees us from much sham accuracy and pretended precision. The judgment of difference is never made apart from a standard of difference. The apparent exception, when such a judgment denies identity of quality, is simply the first step in quantitative comparison, and it is

by quantitative comparison that precision must in such cases be obtained. But the class of judgments from which our later instances are drawn do not refer to identity of *quality*, but identity of *kind*. They presuppose classification, and affirm difference or likeness with reference to this classification. All attempts therefore to introduce a quantitative estimate into these generic judgments of difference are founded on a confusion between judgments of quality and judgments of kind, on an attempt, that is, to reduce the latter to the former. This does not deny that the latter may imply the former in addition.

It is a futile introduction of psychology into logic to speak of measuring difference by the difficulty or duration of a psychical transition; the measure of the difference is what we mean by the difference, and what we mean by it depends on the series or classification within which we affirm it. Apart from such a standard the judgment of difference is nonsense; it becomes like 'The soul is not square.' How idle to inform us that Gladstone and Chamberlain are different! How superfluous to affirm that one plant is like another! Any assertion like these, if it is not referred to a ground of distinction, in these cases to political and botanical classifications respectively, is as destitute of content as a bare negation. The instance of two instruments pronounced out of tune with each other may seem not to be in place under this head, and to be a judgment of true qualitative comparison. I inserted it expressly to indicate the line of demarcation. Different colours are such as do not match, i.e. are not discernible in simple quality. But in comparing musical notes we have not to do with simple quality[1], but with dominant quality[1], i.e. kind. 'A note' is identified by its pitch, and different notes are sounds differing *in pitch*. Therefore in pronouncing notes to be different we do not merely deny that they are indiscernible; we deny more than this, we deny

[1] I use quality in the logical sense, in which it includes timbre (musical quality), pitch, and loudness.

that they are indiscernible *in their dominant quality*, viz. their pitch. That the pitch is itself a quantitative attribute makes no difference; for it is a quantitative attribute, *which has become characteristic*, and therefore stands logically in the same position as any other basis of classification.

In short, then, we must not confuse quality and kind. Kind is dominant or characteristic quality and involves a series of ideas which we have not yet discussed. And whereas comparison in respect of simple quality is prior to and absorbs itself in quantitative comparison, comparison in respect of kind is subsequent to quantity and involves other ideas. An *isolated* judgment of difference can have no meaning except as the first stage of quantitative comparison, the negation of identity (= this and that are unequal). The attempt to assign gradations to the mere judgment of difference rests on a confusion between quality and kind, each of which has in itself an adequate and objective principle of measurement independent of psychical transition, and in the case of kind, incapable of reduction to quantity.

CHAPTER III.

MEASUREMENT—QUANTITY AND PROPORTION.

Measurement and Individuality.

1. MEASUREMENT is the equation of any whole, by comparison, to a numerical aggregate of determinate parts. The parts may be determinate through reference either outside or within the whole to be measured; but if the reference falls within it (as when we say a man's whole height is so many times the length of his head) the whole must be complex and contain subordinate systems. The reference may also take the shape of relations which are not purely quantitative (as a tone or semitone in music, apart from its physical cause, is simply a difference between two peculiar sounds); but in that case we are passing out of the region of pure measurement. Some reference, however, there must be in measurement beyond that to the *simple* whole which is to be measured. It is no measurement of a line to divide it into 100 or 1000 equal parts. We must know *what* else they are parts of, besides being parts of the line to be measured. The length of a line is measured when it is equated to feet and inches—to the length, that is, of some actual piece of metal agreed upon as a standard—the pitch of a note is measured when we have determined its place in the scale or the number of vibrations per second that enter into it; the specific gravity of a substance is measured when we have stated the ratio of its weight to that of an equal volume of distilled water at a certain temperature. Here a verbal difficulty may be cleared away. If the weight of the substance before us is twelve times that of water, our definition of measurement applies straightforwardly. We equate the whole substance in respect of its weight to a numerical aggregate of twelve parts, each of which is determined by equation to a known

volume of water[1]. But if the substance is $\frac{1}{12}$ of the weight of water, we seem not to be breaking up the whole which is being measured into an aggregate of parts, but to be representing it as a part within another aggregate. This is a mere matter of practical convenience. The equation of a whole to a numerical aggregate is as much involved in the expression $\frac{1}{12}$ (a twelfth part), as in the expression 'twelve times.' In measuring, we bring two terms into precise equation, and the entire relation of whole and part is involved in each. The numbers in which the same part enters into two or more wholes are in every case the organon of measurement.

Simple measurement.

i. Measurement is to begin with Simple Measurement, resulting in pure Quantity.

Quantity.

Simple Measurement consists in judging of a perceived object that it is a whole containing a certain number (one or more) of a determinate unit. Measurement is thus a development of comparison, which is the first revelation of the unit, or equal part—the result of successful equation—within continuous quality. Simple qualitative identity, for instance, such as that of colours which match, may be set down to comparison or to measurement according as it is or is not ideally referred to a scale of degrees. In pure qualitative identification we have sometimes no idea of possible degrees, and such identification must be regarded as the earliest germ at once of measurement and of comparison. Thus 'The taste of this is the same as the taste of that' is mere identification or comparison if it only means that the tastes of the two things are indiscernible, but is measurement if we are considering whether the one taste is sweeter than the other. We have seen that

[1] Practically of course we do not heap up volumes of water in one scale till they balance a substance in the other scale. The process employed is equivalent to weighing first the substance, and then the water which it displaces, against known standard weights, and taking the two results as a ratio; i. e. by help of the balance we state the two things to be compared in terms of an aggregate of already known and determinate parts; one thing will = 12 oz. and the other 1 oz.

qualitative identification *is* only the germ of quantitative comparison, and that the two are not co-ordinate[1].

How is the unit fixed? It is fixed, as we have seen, by equation or identification of it as the same throughout the various wholes or aggregates into which it enters as a part. This process of equation tends to repeat itself *ad infinitum*. Pure quantity is an essentially relative attribute. Hence in Simple Measurement the paradox of knowledge takes an extreme form, for every measurement presupposes and provokes others *ad infinitum*. The tables of weights and measures of our arithmetic books are enough to illustrate this. They are long lists of equation after equation, by means of which all objects that are measured or weighed are ultimately equated with some single portion of matter or relation in nature[2], arbitrarily selected as a basis of the division and multiplication that facilitate comparison. The substitution of a determinate physical motion supposed to be constant for a particular portion of matter makes no change of principle so long as it is taken *qua* a term in a fixed ratio or mere ratio, and not *qua* a term in a generalised ratio or proportion. But in fact the two ideas are at bottom inseparable. Everything fixed is *qua* fixed, potentially generalised. The wave-length of what is a particular red to a normal eye does not vary (so far as I know), but this is so to speak an accident; and if we take in non-normal eyes, all that is certain is that this wave-length preserves its place in the colour-series above some wave-lengths and below others. Its fixity for red judged by the healthy eye has however caused it to be suggested for an unit of length. Weight—the relation of a portion of matter said to weigh 1 lb. to all other portions of

[1] p. 123 ff.

[2] Such as a fraction of the earth's circumference. But any such relation is likely to be variously determined at different times, while it is not convenient to alter the basis of a system of measures. I believe that practically all systems of measures depend upon the actual material standard, which as a mere piece of metal, not capable of being tested by any general relation in nature, must be reckoned as a purely arbitrary standard.

matter in respect of their gravity—becomes a generalised relation or proportion the moment we consider distance from the earth's centre. '1 lb. at earth's surface : 2 lbs. at earth's surface :: 1 lb. five miles up : 2 lbs. five miles up.' When a thing is described generically by the number of its own parts this is more obvious, for the ratio is then *ipso facto* generalised by the mere recurrence of individual things. But simple measurement of perceived objects gives simple ratios expressed in singular judgments with external reference. As the judgment becomes general the ratio becomes first formally proportional, because the ratio is generalised as against instances in which it occurs, and then really proportional, because this generalisation comes to apply to cases in which the corresponding terms are *different magnitudes*. The ratio between measures[1] is *formally* proportional; that between weights, explained as above, is *really* proportional.

Complex or mediate measurement. Proportion.

ii. Thus measurement necessarily becomes complex, ideal, or mediate; i.e. in short generalised. In this aspect it first appears within the singular judgment, and then breaks loose from it.

Every relation established by measurement is a ratio, or relation between magnitudes; and as incommensurable magnitudes are *for logic* a contradiction in terms, every ratio can be expressed in so far as it is a true ratio (in so far as its terms are magnitudes) by a relation between two numbers. Number refers the relation to an abstract whole of quantity, and therefore determines the identity of the relation by its place in a self-identical articulate system. But the effect of such expression is to generalise, while the results of *simple* measurement can warrant no generalisation, and therefore are not spoken of as a ratio, and often not reduced to their simplest numerical expression. Nothing would be gained by saying

[1] By ultimate refinement, this too is *really* proportional. Suppose all measurable things to expand and contract preserving their ratios, we could never know it. Given a foot-rule, we could still construct a yard-measure, however the absolute length of the foot-rule might vary.

that a given plant 5 ft. high had a height which was to 1 ft. as 5 : 1, nor by judging that *this* piece of lead is to *this* piece of gold in weight as 11 to 19. The ratios so affirmed would still be destitute of general significance, would be mere facts, alleged of a particular reality present in perception, and would therefore gain nothing, but might lose their truth, by abstract expression.

But thought always tends to coherence and necessity, and we cannot even employ a determinate idea to assist us in pointing out an object of perception without creating the impression that the ideal content which we use will be characteristically connected with the content of our predication. When this occurs in the judgment of measurement, ratio passes into proportion; that is to say, the ratio enunciated as true of the particular given subject becomes a universal rule applicable to all variations compatible with the determinate idea which conditions the subject. Such measurement is complex, because the unit on which it is based is no longer single and fixed, but variable in absolute magnitude, though determined by a condition. It is ideal, because no longer a mere fact of sense-perception, but enunciated as flowing from a content intellectually defined. It is mediate, because the reference to reality which constitutes this as every judgment, is not direct, but has to pass through a condition before it can attach to reality.

Therefore if we take one of the above simple measurements, and even without removing the demonstrative 'this,' insert a determinate condition into the content, we shall find that the whole affirmation is greatly modified in its nature. Let us judge that 'This piece of lead and this piece of gold, *being of the same volume*, are found to be in weight as 11 : 19.' Then we at least suggest the erection of the ratio 11 : 19 into a law of proportion: 'The weights of equal volumes of lead and of gold are as 11 to 19.'

So again, we may have simply counted the leaves on a plant-stem, going round the stem in the same direction,

till we find a leaf immediately over or under that from which we began. If we do not know that these ratios are characteristic, or if we suspect the plant to have been injured so as to make its ratio undiscoverable, we may simply judge, 'On this plant I find five leaves in going twice round the axis.' Whereas if we insert the name of the plant or tree, and use an abbreviated expression for the ratio of divergence, we at least suggest the idea of a characteristic law of the leaf spiral. 'This oak shows a divergence of $\frac{2}{5}$' (i. e. the sixth leaf is directly over the first, and in counting from 1 to 6 you have gone twice round the stem). It is obvious that here generalisation and characteristic attribution have begun. Granting that we have not yet any assertion about the *genus* oak, or even about the species in question, for the 'This' hinders such an interpretation, yet we unquestionably are awakening to the expectation that the tree before us will present the ratio in question in all its different parts and from time to time, and to the problem whether and how far we may drop the 'This' which indicates particularity. When the 'This' is dropped the judgment ceases to be singular, unless it is attached to a proper or in some way individual name. Whether and how far, failing these refuges, it ceases to be categorical and becomes hypothetical, or how far individuality continues or even revives after the loss of particularity, as a factor in the evolution of thought, is a question which will frequently occupy us in the sequel.

Characteristic ratio, or proportion, may refer to standards external to the whole which it qualifies, or to relations within that whole. In the former case the qualitative quantity remains subject to relativity and eked out by equations *ad infinitum*, hardly less than in the case of simple measurement.

In any table of specific gravities, for instance, we have a number of substances each severally characterised by the ratio of its density to that of distilled water at a temperature of about 39.1° Fahrenheit. Now in the first place, each of

these several ratios may obviously be regarded as a proportion in so far as it applies without variation to any volume of the same substance, in the sense that the weight of *any* volume of any substance is to the weight of the same volume of water[1] in the ratio of the specific gravity of the substance. Proportion is defined as 'equality of ratios'; and equality of ratios obviously is identity of *the ratio*, and exists between every ratio and all cases in which it applies.

But in the second place, although in these cases we have proportion, yet we have also relativity *ad infinitum*. Select the specific gravity of some one body, and suppose that of all the rest except water itself to be erased from knowledge; the significance of our one fragment of information would then be all but gone, were it not for the accessory idea, which we cannot now get rid of, that the rest could easily be recovered. Apart from this accessory idea, the supposition makes it plain that the ratio between the density of silver or flint glass and that of water is not sought out as valuable *per se*, but is valued as a means of equation with all measurable densities. In such instances as these we have the first grade of characteristic quantity or proportion, still subject to an external relativity which extends into an infinite series.

Now though this relativity never disappears as an aspect of human knowledge, yet characteristic quantity can assume a more self-sufficing position than that which has just been described. Instead of developing the *this* and *that* of the comparative judgment into separate units connected only by an abstract identity of quality, we may consider them as structural elements within a concrete whole. As before, we shall find ourselves at first in the stage of simple measurement and pure quantity. But the tendency to advance to proportion is in cases of this type much more pronounced,

[1] I omit for the sake of brevity in this and parallel cases to repeat in every sentence the precise determinations by which the standard unit is made a standard. But it is all-important to remember that there are such determinations, and that they in turn need re-determination *ad infinitum*. There is no ultimate unit.

because the parts of an individual whole are more likely to vary in connected ways and therefore lend themselves to proportion, than the elements of wholes external to one another. Still we begin with pure quantity. '*This* plant has petals exceeding the calyx segments,' or 'has radical leaves half the height of the stem,' or 'has twenty-one carpels and forty-two stamens,' or, as we said above, 'has a divergence of $\frac{2}{5}$ between its stem-leaves.' In the first instance such judgments as these are mere judgments of perception, or at the outside of direct historical fact, and the ratio which forms the content of predication is therefore not a proportion, because it has no extent of application. In proportion, the ratio is to the cases of the ratio as Intension to Extension.

But the moment thought has seized a designative idea, it is committed and must go wherever the idea carries it, in despite of the demonstrative 'this.' And the moment that any such internal ratio as those which I have suggested is taken to be characteristic, i. e. to be involved in the designative idea, it becomes a *proportion*, i. e. a law of structure which holds in spite of varieties of size, shape, and number, although, at least in natural objects, always subject to limits which as regards the proportion itself are arbitrary and external.

Proportion is the simplest expression of individuality. All intelligent recognition of individual objects depends either on proportion or on some principle which involves proportion. It is in this that the truth lies of the well-known Pythagorean doctrine that all things are embodiments of number. All things have aspects and effects which find generalised expression in number. Shorten a snipe's beak, take one from the divisions of the horse-chestnut leaf, or misplace the accent (a variation of loudness and duration) in an English word, and recognition falters or fails. Even a human character or an artistic inspiration, though not in itself susceptible of numerical expression, leaves traces in all its acts and products of an individuality that takes shape

in proportion or qualitative quantity. An exhaustive statistical treatment of a man's life in all its tangible aspects would give, by the graphical method, not indeed his character, but a set of proportions penetratingly significant of his character.

It may seem indeed that in common hurried thought recognition simply attaches to some pre-eminent quality, a bright colour, a marked outline, a peculiar movement; and that such elements as these, without extension into proportional systems, furnish the practical meaning of words in ordinary life. But in the first place, this is perhaps a superficial analysis of perception. I very strongly doubt if the element of proportion, both external as in size compared with surroundings, and internal as in shape, symmetry, or harmony of sound or colour, is ever absent in a recognitive perception of an individual thing. A really abstract quality would hardly mean anything; we should be able to place it nowhere in our world; and if we even recognised its degree of intensity, that would at once constitute a quantitative element. It has indeed been observed that a familiar scent (one of the least articulate of qualities) has a notable power of stirring associated memories. But this seems so noteworthy just because the scent does *not* recall any individual thing, but rather brings back a general state of feeling connected perhaps with entire scenes and incidents, but especially with emotions.

And in the second place, if an abstract or mere quality were used designatively in judgment, it would not grasp or enter into the nature of a real individual; it would simply be a falling back towards the demonstrative affirmation with its 'This,' which may on occasion be eked out by any element that draws attention.

But all ordinary recognition of individuals undoubtedly depends on the judgment of proportion. We cannot indeed tell the specific gravity of a metal by the mere sense of pressure or of resistance, but we know how a sovereign ought to feel when we lift it on the palm of the hand; and though we may call this effect on the hand a quality, it is

plainly a quality pervading differences and so quantitative, and moreover taken as characteristic and so proportional. Consider once more the effect of altering an accent in English (I do not speak of languages in which accent depends on pitch) as exemplified in the change of 'conquer' into 'concur' by transferring the stress from the first to the second syllable, or the utter unrecognisability of such a term as 'sleeping-car' when pronounced with a heavy stress on the second syllable[1], and a light stress on the first. Here it is the internal proportion that is modified, with the result of destroying the peculiar rhythm by which in a great degree the ear instantaneously recognises a word. The more marked an individuality is the more it depends on internal proportion. Every instrument fitted for a purpose has internal proportions dictated by its purpose; a knife is sharp at the edge and blunt at the back; the thickness of the blade in its transverse section depends on the requirement of strength on the one hand and on that of dividing without displacement on the other, and these requirements together dictate a certain set of proportions characteristic of a blade suited for some particular purpose. The length of the blade compared with its width depends on such another set, and its temper on a third. All of these being on the one hand relative to each other and on the other hand relative to a purpose are internal proportions subject to limits prescribed by external proportions. It is by acquaintance with the perceptible character impressed by such proportions as these that we readily pronounce on the use of objects made by the hand of man, and that we detect, somewhat less readily, the *actual* purpose served by adaptations in the organic world. Such attributes as are expressed in these proportions form, for perception, the content of individualities.

It follows from these considerations that the question of individuality in contents the main attributes of which arise from external proportions is not an easy one. Such are

[1] The author once heard the words thus mauled at Calais, and could not imagine what was being said, though no elements of the sound were omitted.

nearly all inorganic substances, except where adapted to a purpose by man. External proportions *per se* produce no effect of individual unity, and though it is true that all substances occur in particular fragments which have definite characteristic forms, yet the ratios which would express these forms are not absolutely typical or essential (though perhaps all substances prefer some shapes to others, and have typical fractures, &c.), nor do the particular masses of substances or volumes of gases demand or receive individual names. Professor Jevons has called attention to this curious fact, which goes deep into the nature of individuality. Below the level of organic form, or form given by human interference, what do we mean by a *thing*? Of course we may take a lump of metal or an ounce of water, a handful of sand or a jarful of chlorine, and speak of it as a thing; but we shall be puzzled to find any name that recognises its separate identity as 'lion' or 'spade' or 'house' recognise that of the contents that form their meaning. Is gold a class-name, say a specific name, and are the actual pieces of gold individuals under it? This does not seem to be right; a class-name is true, without further determination, of the individuals under it. 'This is a lion,' 'This is a spade,' &c. But you cannot say 'This is a gold': you can only say 'this is gold,' where 'gold' almost='made of gold,' i. e. is adjectival, and has no plural, or if it has one, uses it for different kinds, not for different pieces, of gold.

It is enough at present to call attention to this difficulty as illustrating the place of structure in individuality. It should be noticed that a structure however complex which repeats itself homogeneously throughout all atoms of a certain substance tends to confer individuality, if at all, on the minute units in which the complex structure exists, but neither on the substance as such nor on its larger fragments; the supposed minute structure is not the structure *of it* or *of them*, but only a structure repeated *within* it or them. A heap of corn is, *qua* heap, no more organic than a heap of sand. But it may be for instance that, in virtue of a

common structure, all the iron that anywhere exists is united by reciprocal reaction in a common magnetic world; if so, it is then up to a certain point single and individual. The further consideration of this difficult subject belongs to the discussion of the Individual and Generic judgment.

Qualitative unity of Individuals.

iii. The relation of Quantity to Quality results at this point in a further problem. Assuming that a thing which has marked individuality has always a number of pervading qualities, each of which contains gradations and a distribution expressible by a ratio or proportion, what are we to say of the interconnection of these various systems of proportion with one another? Is it necessary that there should be a general proportion of proportions which, whether our actual apprehension of it be rough or exact, must be taken as capable of expressing the various systems of attributes as gradations within one and the same totality? Is there any sense in talking of the proportion not only of length to length and of colour to colour, but of length to colour; or of the proportion not only between rhythm and rhythm or pitch and pitch in a melody, but between rhythm and pitch as elements of the musical effect?

The view which we took above of the effect of comparison upon quality forces this suggestion upon us. *If*, in other words, a single qualitative effect pervades any and every totality which we apprehend, and *if* within such a quality there are parts perceived as differences *of it*, then these differences must in respect of that quality be regarded as gradations. It is not necessary to press this conception home at present. It is possible that there may be individuals whose unity lies in an idea only and not also in a quality, and that an idea may hold together without crushing them into gradations, antitheses which a quality could only admit as quantitative. But it is worth while to bear in mind two things. In the first place, the initial judgment of mere difference, 'Colour is not form,' may always be regarded as an equation of one term to zero of another. And in the second place, there may be a quality of 'effect,'

or secondary quality, within which even form and colour or pitch and rhythm may take their place as degrees, just as the repetition of analogous though different forms in a picture or design gives the impression of a pervading character which is more and less intense in different parts of the work. Take for instance a picture about which there is a question whether Turner painted it, or a song which is ascribed without certainty to Shakespeare. In such cases we point to this and that characteristic as more or less Turneresque or Shakespearean; and the elements so designated need not be in actual sensuous quality comparable with each other. It might even be suggested that the exhibition of such a pervading quality was a condition of æsthetic though not necessarily of actual individuality; a suggestion which would raise the fundamental problem whether all actual individuality has, for those who have eyes to see, a thorough characteristic unity. It would seem not improbable that *true* individuality is attained by *actual* individuals in very different degrees.

Change and motion in reference to Individuality.

iv. In explaining the apprehension of individual things, which I have set down to the sense of proportion, it is usual to lay stress on the fact of change, including motion. Change in time and place is no doubt a primary instrument in revealing the fact of individual existence. The moveable and modifiable Thing proclaims itself unmistakeably as distinct and permanent. Nevertheless, for logical purposes change is only a case of difference or negation; or if in fact the two are coextensive, yet change is not the essence of all difference. It may be that every apprehension of difference requires lapse of time, but this is only because our activity is in succession, and does not mean that the differences themselves must be (though they may be) successive.

What the whole matter comes to is this. Difference is the principle which when generalised is known as Negation; in as far as contents merely differ, they are merely not each other. Every continuous quality includes negative determination, i. e. differences, elements which are not each other.

Among other continuous qualities, duration and extension characterise a large part[1] of the world of sense-perception, and duration characterises in one aspect everything that comes before the human intelligence. It is not, therefore, surprising, that not only the parts or elements of individuals, but the individuals themselves as parts or elements of our perceived world, should bear a negative relation to each other and to themselves in time, in space, or in time and space together.

Now if we contrast change and motion on the one hand with mere perceived difference on the other, as influences bearing upon the apprehension of individuality, the distinction between the two cases amounts simply to this, that in the latter we have a single set of differences, which can go but a short way, as a rule, to exhaust any identity, while in the former we have at once a summary of innumerable differences or negative relations. These differences, in virtue not of their mere spatial or temporal distinctness, but of their positive content, are read off in judgments which may[2] coalesce into one or may be distinguished into several determinations of the individual. These judgments may have a negative or positive form, but must always express a partly negative element of apprehension, viz. that 'what is not B is not A.'

When we see a moving animal against a variously coloured background, different elements of its outline and colouring are successively thrown into relief by successive contrasts, and perception traces its form with increasing completeness by the negations which these contrasts furnish, i. e. by the correction which is effected when a line or colour, which the moment before ran into the background, is sharply defined by a change of contrast. The perceptive judgment resulting from this change will take the shape 'That (the

[1] I cannot think that sonorous bodies appear to be clothed with sound as luminous bodies are with colour. To me sound is an unextended perception, though referred to a cause in space.

[2] See the general theory of judgment in time, chap. i. above.

dubious border of colour) was not B (a particular part of the animal's outline) and therefore is not A (does not belong to the animal).' More elaborate interpretations than this may of course attach themselves to the motion of a separate material thing; thus, for instance, that which moves all together must in all probability have mechanical cohesion, for it is unlikely that in presence of varying friction at its different points the parts of a moving appearance should keep together apart from such a condition. But cohesion is for our present purpose merely a definite content assigned to unity, and the negative relation of the moving *thing* to what does not partake of its cohesion is established by just the same logical process as its relation to that which does not partake of its distinctive shape or colour. Change in time without motion has the same effect; nothing is more readily detached from its background and apprehended as individual than an object whose transformations take place before our eyes in surroundings which do not share them. The judgment or judgments[1] 'What is not a_1, a_2, a_3, &c. is not A' seems to form itself in such a case almost without an effort of mind. We shall be told indeed that 'What is not a_1, a_2, &c. is not A' is a mere inference from 'A is a_1, a_2, &c.' This objection would raise questions which cannot be dealt with till we treat of negative and of inductive inference. Here we need only insist that however we may elect to describe the process of the negative instance, it is easily seen to be the most effective instrument of definition. When we inject a system of vessels with coloured fluid, in order to observe them under the microscope, it is not the particular colour, red or blue, that we look for, but the contrast between the artificial colour and the dull grey or yellow of the background. Even granting that we start from 'The vessels which are to be traced (A) are the red lines (a_1, a_2, &c.),' still this judgment cannot have scientific precision apart from the determination of the detailed not a_1, not a_2, &c.; and when the not-a's assume a positive character, the negation ceases to be an inference

[1] See the account of judgment as an act in time, p. 85 ff.

from the affirmation A is *a*. And *change* is an infinite succession of such contrasts, that gives every element of the complex individual before perception its chance of being sharply defined, and by successive negations defines each of them both against its own permanent elements and against the background. Instead of the simple change of colour by injection, let us think of the effect produced by rotating the polariser or analyser while observing an object that modifies polarised light. The successive but gradual changes of colour, illumination, and background which are thus obtained bring out the details of a structure as clearly as if we could handle it and move it freely in space. Change and motion merely do for a single individual identity what a comparison of instances does for an abstract identity. That is to say, they show through what contrasts the individual can pass, to what negations it can be subjected whether within its content, or between its content and the background from which it is distinguished, without losing characteristic identity. Change and motion have their logical value simply as embodiments of difference.

Abstraction and Necessity.

v. In the Judgment of Measurement we find ourselves face to face with the element of abstraction and necessity, the medium in which exact science moves, and the occasion of the most fundamental *crux* for logic as for ethics. We are no longer, as in the Judgment of Quality, simply ascribing the meaning of an idea to an unspecified reality given in perception. We are indeed, as always in judgment, defining the reality which perception presents to us; but we find that in trying to define any special feature or element within it, we are under constraint, not merely as always from the pressure of perception, but from the inability to select and connect at pleasure within the presented content. Judgment—so far as it escapes from the distractions of mere association—proceeds in grooves or along threads which are always leading it across and out of the picture. It cannot, in the present stage at all events, simply characterise a given identity by differences related to it and

to nothing else. Such differences, as we have seen, would have no stability, and could characterise nothing; although the more highly organised and individual the identity the more capable it is of prescribing a necessity to subordinate wholes which appear as differences within it. The course of judgment within the present whole of perception is determined by connections which refer beyond that accidental whole, to other more comprehensive totalities, and ultimately, in every case, to the system of the known world. The connections thus prescribed between part and part within some systematic whole are *necessary* connections, and judgment, in so far as it is controlled by them, is abstract or hypothetical judgment.

But the appearance of this element in the judgment of perception makes it simply self-contradictory. The specification of a subject by means of an idea, which is only meant to point out a feature in present reality, brings the judgment into a groove of necessity, and all but makes its affirmation conditional. A speaker who has affirmed that 'This execrable ruffian should be hung' will probably, if convinced that the man is not a ruffian at all, consider that the non-existence of the condition precludes the application of the judgment; i.e. in spite of the 'this,' he will maintain that his judgment was essentially conditional. We shall not find it easy to decide whether the idea in question was really a condition or a predicated content. In the latter case the judgment is falsified by the non-existence of the fact indicated in the subject, in the former it is not. There can be little doubt that we must follow the analogy of 'this,' 'here' and 'now,' by treating ideas, which designate the subject, as presupposed rather than affirmed; but seeing that in this case the idea which forms the presupposition is such as may or may not be realised, and yet is welded together with a presupposition—the 'this'—which cannot but be realised, there is an inevitable ambiguity in the judgment, —the ambiguity between absolute and conditional assertion.

Absolute

vi. In logic as in ethics, Individuality or Absoluteness is at

first sight opposed to Necessity or Relativity. That which is individual or absolute claims to be self-sufficing; that is to say, to be an Identity which determines and is determined by its own differences, but is not dependent on anything outside itself. Every content partakes of this character in so far, but in so far only, as it has a unity or an interest for its own sake or in itself. A material 'thing,' an organism, a work of fine art, possesses such unity in a degree that forces its individuality upon perception and ensures it universal recognition in language. But every content without exception that is exhibited in judgment has such unity or interest in some aspect or to some degree. Even the abstract idea that qualifies 'this' in a perceptive judgment such as 'This cold is intolerable' is taken as the key to the interest of a presentation, as a predominant feature that arrests attention in our momentary surroundings. That the distinctive character which makes the unity of the presentation is abstract and indeterminate follows merely from the judging function being in a rudimentary stage to which a concrete synthesis is still unattainable. and Conditional Affirmation.

On the other hand, every judgment may also be regarded under an aspect of relativity or necessity. In so far as a content is necessary it is not self-sufficing, but is a consequence of something else, and in so far as it is relative it fails to explain itself, and refers to something else for explanation. Every content, every identity in human knowledge is on one side wholly of this character. How the two sides, the absoluteness and relativity of the objects of knowledge, can coexist without interfering may be considered if we please, though in my judgment erroneously, as a desperate problem. But that they do coexist we may convince ourselves by the evolutional history of any flower, by the analysis of any ornamental design, by the study, in its genesis and with a view to the influences that conditioned it, of any human mind. And, in one sense, necessity is more universal than what I call absoluteness, or if I may coin a phrase significant of the sense in which I speak of absolute-

ness, morphological unity. Morphological Unity has degrees, but relativity or necessity has none. The only escape from relativity is in the exhaustion of relations. If, for instance, we can intelligibly speak of the universe as a whole, we must take it, I presume, as the totality of relations, and therefore as bearing no relation to anything outside itself. But this speculation is unprofitable, because what is out of relation is out of knowledge; or it has at most a negative value as against doctrines which extend the relativity which holds within the totality of relations to the ideal totality of relations itself, and so discuss its origin or the possibility of it not having been. This is futile, from the very nature of explanation. All explanation is *within* the universe, not *of* it. Therefore every content that designates a subject invites consideration as an antecedent in necessity in a judgment 'if *a* is, *then b* is,' while it is *not* every content that has morphological unity and so is given as a whole in each and all of its differences. And only such a content as this is adequate to reality, or can stand, without special symbols of reference, for an individual reality. What is not individual cannot as a whole be real.

The above considerations were touched upon in chap. I. in explaining the pregnant distinction between Categorical and Hypothetical judging, and are to govern, as was there indicated, the application of that distinction in the remainder of the present Book. We start from the principle that all judgment whatever is an attempt to make explicit the nature of Reality, and is directly or indirectly attached to the reality which is presented through perception. The ultimate subject of all Judgment is the Real, and any idea which appears as designating or even as in lieu of the subject of judgment must be taken as simply indicating or calling attention to some aspect of the real world. That is to say, such an idea must be taken as morphologically corresponding to the 'this,' 'here,' or 'now' in the demonstrative judgment, to the unnamed direction of perception in the pure judgment of quality, or to the designative ideal con-

tent which expands the 'this' or 'here' in the elementary judgment of measurement. It follows from this that in every judgment the immediate subject is *prima facie* taken to be real, and therefore every judgment is *prima facie* taken to be categorical. This does not mean that in the strict sense it *asserts* real existence of the subject, for its real existence is presupposed [1], but rather that it defines the reality of a real existence presupposed as subject.

But this *prima facie* semblance of the judgment must be qualified. The explicit content which designates the real subject may be inadequate to the nature of reality. In 'this red thing,' 'this metal,' even 'this man,' the explicit contents 'red,' 'metal,' 'man' are typical and general, not single and individual; and still more is this the case if we think of such judgments as 'Red is a colour,' 'Metal is lustrous,' 'Man is mortal.' These contents stand for imperfect and incomplete realities; realities that could only be completed in an infinite series of time and space. The difficulty is not that they go beyond present perception and beyond our knowledge. Caesar is not in present perception and we do not know all that he did, yet in 'Caesar crossed the Rubicon' no one doubts that Caesar is a reality. Caesar is an individual, and his entire identity is present in his every act and attribute. Man is no doubt a definite concept, but its instances or manifestations have not *prima facie* individual identity one with another. The centre of morphological unity is in each separate human being, not in the idea of the race as such. The concept, *as we commonly think it*, is an abstract idea, and the reality that corresponds to it is a series of individuals, which not merely is *not yet* actual as a whole, but is not in our predication treated as an actual whole. The reciprocal relations which bind together say the English nation or the Roman Empire into a historical individual may be present also more or less in the case of humanity, but when we say 'Man is mortal' this is not the light in which we look at the Subject; we are speaking of

[1] See last section.

individual men whom we designate by help of the concept man, not of humanity or mankind as such, for which it might be maintained that morphological unity is possible. No doubt however, if we push the matter home, even the predicate mortality is affirmed of all individual men in virtue of a oneness of nature running through them all; and therefore we must, as I have said, take the individual unity to be a matter of degree, and to be wholly absent in no content that can be presented to thought as designating a subject of judgment.

When, in view of cases like these, we qualify the principle laid down above that in every judgment the subject is taken as real, we must do so by the emendation, 'The subject is taken as possessed of that kind of reality of which it is capable, subject to any alteration which the predicated content may declare in such reality.' The first part of this sentence provides for judgments introduced by abstract ideas and not referred to actual individuals, the second for all kinds of judgments which formally affect reality and which are alleged[1] as proofs that content and reality cannot depend upon one another. First among these come the Negative Judgment which sets up an aspect of Reality in order to demolish it, and then all such peculiar cases as 'The chimera is a fiction,' 'Nothing is here,' 'A wise knave is a contradiction in terms.'

The view to which I have just alluded might raise an objection at this point, which I will only mention in this place, as the real answer to it, if any, can only be found in the whole conception of the judgment which we have adopted. 'Whether an idea stands for a reality or not does not depend on its content, but on that content being recognised as somehow and at some distance or other belonging to the world continuous in quality with the object of present perception—i. e. to the actual world.' My answer to this would be that I have accepted this identification in quality as the abstract logical or rather as the psychological condition of all judgment; but that this

[1] Bradley's Principles of Logic, p. 14.

identification is empty apart from the specific kind and degree of reality assumed or alleged, and this, as it appears to me, is a matter of content and of content alone.

The Hypothetical Necessary or Relative aspect of judgment is a consequence of the designation of the subject by any *determinate* ideal content. It is the universal connection of attributes within systems, as opposed to the morphological unity of individual systems upon which that connection rests. This aspect is undoubtedly perceptible from the moment that the immediate subject is made explicit by help of ideas, but as long as there is a gulf between the ideal content and the latent reality which it designates—the 'this'—the necessary aspect of the judgment is absolutely dissociated from its categorical aspect, and the divergence almost amounts to a duality of the judgment. In some cases indeed the contents employed to designate the subject will have only a partial connection with the predicate, as in 'This flower is a rose[1].' Such a judgment has been called a double appellative judgment. But I incline to think that affirmation of this type is always on the road to necessity; 'flower' does not indeed tie down the predicate to 'rose,' but the thread of botanical classification runs through both. If it were not a flower it could not be a rose. So the two designations are undoubtedly chosen with reference to one another, and the true duality of the judgment is not in christening the rose twice over as rose and as flower, but in the ambiguity between 'This is a rose' and 'This, *if* (or 'in as far as') it is a flower at all, is a rose,' which might well be said of the Tudor rose as it appears in some decorative designs.

The judgment whose subject is designated by a proper name is at first sight devoid of necessity. For in it determinateness of content is sacrificed to the indication of actual continued individuality, and therefore the relation of necessity or hypothesis, which depends on determinateness of content, is not easily traceable. Yet a name is always

[1] Cp. Sigwart, vol. i. p. 62.

capable of acquiring a definite content, which at once brings such a relation into prominence. The indignant denial, 'Gladstone never said that,' 'Socrates never gave immoral advice,' is obviously hovering between the sense of 'A. B. did not go to town to-day' and that of 'An honest man cannot say what is certain to mislead,' that is to say between the assertion of fact and that of necessity. And again, if, as explained in the last paragraph, the content which designates the subject has not the nature of a complete or individual whole, then its reality must be taken as that of which alone it is capable, viz. indefinite presentation in the series of space and time; and this amounts to so little (for the presentation may be as rare as is consistent with occurring at all) that the element of necessity or relativity dominates the element of unity or actuality, and the judgment appears to have as its essential content a necessary sequence or connection about the presence of which in reality little or nothing is affirmed. Such a judgment, and every judgment in as far as it can be thus regarded, is hypothetical, that is to say it runs wholly or partly along a line which may be formulated as 'If *a* is (or in as far as *a* is), then *b* is (or so far *b* is).'

On the other hand, even those perceptive or historical judgments, including ordinary assertions about people or places called by proper names, which betray in their content no tendency to enter a groove, i.e. to exhibit a universal connection of attributes, nevertheless must be held as bound by this ideal, which is involved in the employment of contents which have a meaning, and therefore can acquire a determinate meaning. If then, as in such instances we may assume to be the rule, the contents actually employed in judging embody no principle, but merely exhibit irrelevant differences as coexistent in a concrete subject, such judgments, even when true in their first meaning as mere statements of fact, are yet fundamentally false. That is to say, they are true in their categorical aspect but false in their hypothetical or relative aspect, from which, being

definite judgments, they cannot escape. They do not express an *a*, upon which, within some real system, the content of predication follows as *b*. But it is important to remember that we are dealing from beginning to end with aspects and not with total differences. I believe that a misapprehension on this head has of late years given rise to an erroneous conception regarding the tendency and goal of knowledge.

Knowledge as both absolute and relative.

vii. It is a great thing to have raised the notions of Logic to a level with the ideas of exact science. This has been done by Mill and subsequent writers[1], and the work had become necessary, though the views to which it led were not in principle new. The essence of judgment was by them declared to lie in the coexistence and rational connection of attributes, and the ideal of science to consist in the knowledge of the fewest assumptions, from which, if given, the whole course of the world might be deductively derived. As a consequence of these ideas, the universal judgment was, in part by Mill himself and more distinctly by later writers, identified with the hypothetical or abstract affirmation of necessary connections; and, further, by identifying this type of judgment with the extreme case of supposition for the sake of argument, the universal judgment as such was denuded of all affirmation having real content. It was still treated as affirmed of Reality, but was held to be related thereto as a known consequent to an unknown antecedent. It was pointed out that in supposal for the sake of argument no element of the content supposed or of its consequence is affirmed either to be actual or even to be possible, and that nothing more is alleged as fact, in judgment based on supposition, than that Reality, which itself does not appear within the judgment, is such as under the supposed conditions to exhibit the inferred consequent.

[1] Mill's Logic and Lotze's earlier Logik seem to have appeared in the same year (1843). Lotze, I presume, was largely influenced by Herbart on the point in question. I have in my mind also Sigwart, Wundt (whose doctrine of 'Gegenstandsbegriff' does not however seem to me perfectly clear), and Bradley.

Truth, it might therefore be concluded, may be taken to illustrate, but it cannot be taken to define, reality. The strong implication of actuality which attaches to the content of many ordinary universal judgments was dismissed as explicable on grounds of habit and confusion. Thus the categorical judgment, in the sense of a judgment which asserts any specific content to be actual, was primarily confined within the limits of affirmation about individuals in space and time, although in disjunctive judgment, and in judgments, if any, dealing with existences beyond time and space, a categorical character was admitted to reassert itself.

In contrast with the conception of logical progress and with the ideal of knowledge which I have just described, it appears to me that a somewhat modified form of the views in question might yield less one-sided conclusions. I should prefer to regard the normal and central evolution of judgment as categorical from beginning to end, and as gaining, not losing, in this characteristic as it passes from perception and history to the more complete forms of science. The implication of real existence which attaches to the content of ordinary generic and universal judgments seems to me to be of the same kind as the implication of existence—for it is no more—which accompanies the demonstrative 'this,' 'here,' or 'now,' or its expansion by a significant idea, or a proper name, or the significant name of any actual, even if not in the full sense individual, totality, such as the English nation, or the Natural Order Rosaceae.

The main function of judgment would then be identified with the exhibition of individual totalities at once in their absoluteness and in their relativity. We should thus not wholly subordinate classification, type, and individuality to the claims of explanatory theory, but endeavour to represent the two as complementary and indispensable aspects of knowledge. Abstract and ideal judgments like those which embody the necessary connections of

geometry we should rank as an indispensable divergence, but still as a divergence, from the natural track and tendency of reason, and as attaining their truth most fully when, returning towards that track, they are taken up into the precise determination of typical structure in space, or even of individual realities. We should refuse, in spite of identity in linguistic expression, to take supposition for the sake of argument as the type of universal judgment, and should point out that as supposition passes from selection within reality into free imagination it becomes detached from the real ground of all relations, and ceases even to exhibit a necessary relativity.

It is in accordance with these views that I have treated measurement as involving both the revelation of Individuality (morphological unity) through characteristic ratio, which is the same thing as proportion, and the exhibition of relativity by the reference of the unit to something outside the individual. I now proceed to speak of kindred judgments, which present the essential aspects of measurement in one-sided modifications.

CHAPTER IV.

MEASUREMENT (*continued*)—ABSTRACT QUANTITY.

One-sided forms of Measurement.

2. INDIVIDUALITY as revealed in measurement may be simple or complex, and, if complex, it must involve a variety of simple factors. In a simple individuality, or the simple factor of a complex individuality, the qualitative distinctness of the parts is at a minimum; for any exceptional qualitative difference in any part would challenge measurement and constitute a complication within the unity. When an individual is thus taken in its simplicity, in a single aspect, and yet considered as being a whole complete in itself, it is treated as a whole of *quantity*; that is to say, such a content as is exhibited in the predication of the comparative judgment, but taken as standing in the place of the individual Subject, now that the conception of individuality is attained.

Enumeration.

i. In such instances we find the simple quantitative whole which is thought of as constituted by absolutely homogeneous parts—an idea which we have seen to be never strictly true, for without *some* distinctness of quality the parts would cease to be. Such a whole differs from the normal individual by the lack of anything that can be called dominant, essential, or characteristic within the content itself. There is, for instance, no need to consider its unity in the light of a secondary or aesthetic quality. The unity is already that of a continuous quality, and in the attempt to define it, it lapses almost wholly into relativity, for the determination of the whole depends on the equation of the parts, in an unending series, with other and independent standards. Thus the purely quantitative whole is characterised by being capable of construction by ideal repetition of a unit or fixed part; and such ideal repetition is *enumeration*. Enumeration may seem prior

to measurement or identical with it; in measuring we enumerate units, and whenever we enumerate units we measure some totality. When we count the carriages in a railway train we are measuring the train, when we count the sheep in a flock we are measuring the flock, just as when we count the feet and inches in the length of a room we are measuring the room. But usage, as we feel at once, does not bear us out in speaking of the two former instances as measurements, and the reason is plain. In measurement we start from a whole which we characterise by its differences; in enumeration we start from a distinct unit, out of which we desire to construct a collective or aggregate whole—a sum total. The whole in enumeration, which is a predicate, is a weakened form of the individual whole in measurement, which is a subject; and the unit in enumeration, which is a subject (generally distinguished by a natural individuality), is a strengthened form of the distinct unit, ideal part, or constant difference, which forms the predicate in measurement.

Enumeration is therefore in one sense posterior to measurement, because it presupposes, as a naturally distinct unit, the 'thing,' the idea of which can only be furnished by a sense of proportion or perception of limit; but, on the other hand, enumeration is an *instrument* of *precise* measurement, which involves the notion of a scale of degrees or aggregate of homogeneous parts. The two processes are constantly concurrent, and only differ in the respective values of the parts and wholes with which they deal. It would be futile to distinguish them from one another, but for the consequences which result from the possibility, first exemplified in abstract enumeration, of systematising the synthesis of parts without relation to a whole. The whole of enumeration is depressed into a mere aggregate, or not even a definite aggregate, and therefore the part into a mere unit, or even into the mere place in which a unit might be. The process with all its corollaries, including the three unreal infinities of Number,

Time, and Space, must be regarded as belonging to a form of the judgment-function in which the relation of whole and part is denuded of all structural variety, and therefore the aggregate or sum which is the outcome of that relation lacks predominant unity. This principle is expressed in the saying that in a numerical system the sum of units is the same whatever may be the order in which they are counted, i. e. any part (*qua* part of a total formed by enumeration) can be interchanged with any other part without modifying the whole in which they are parts.

Corollaries. I proceed to state and illustrate some corollaries which follow from the above idea of enumeration.

Simple counting. a. *Simple counting always consists of a series of singular judgments, and is in this respect on a level with simple measurement.*

However abbreviated or abstract each step in counting may be, it can always be expanded into a singular judgment which records its own position in a coherent series. In counting the birds in a covey, or the stitches in a bit of needle-work, we often merely repeat aloud the words 'one,' 'two,' 'three,' and the real nature of the judgment which accompanies them is open to question. In fact, each of these numerals in such a case implies a separate singular judgment, though extreme abbreviation tends to conceal its structure. The essence of counting is in just such a progressive distinction as is conveyed by 'this,' 'that,' and 'the other'; 'alter' and ἕτερος have almost the value of numerals. The exclamation 'One!' when we are beginning to count any set of objects means '*This* unit is a part in the whole which interests me,' e. g. 'One—two—three—*eight* birds in that covey.' The bird is the naturally distinct unit by which in so simple a case we proceed as a matter of course, and the covey is the total up to which we wish to count. If birds get up belonging to another lot, we shall probably desire to keep them distinct, and so count them separately, beginning 'One,' 'two,' etc. over again. It is plain in this or any similar instance that we do not

count right on as long as units can be found, but that every step of the enumeration is made with reference to a limit as well as to a unit. This limit, however disguised by our caprices and interests, is simply the common or continuous nature of the unit in so far as it interests us, and in every enumerative judgment without exception the elements of separate unit and common nature may be traced. The unit need not be externally distinct or physically separable; and the common nature, instead of being hard to trace, may all but obliterate the differences that exist within it. But it is the nature of the unit that furnishes both rule and limit of enumeration, which is a process unmeaning without a limit and impossible without a rule. If we are told to count even all the 'things' in a room, we shall find ourselves obliged to ask what is to be reckoned as a 'thing.' Is a book-case with 500 volumes in it one thing or 500, or 501? 'In a room,' however, is a kind of limit, and assigns a totality to be constructed by synthesis; but if we are asked simply to count, we should reject the request as pure nonsense, because it assigns no totality to be constructed by counting.

What, then, is the meaning of counting 'One!' 'Two!' 'Three!' in starting a race, or of—

> 'And still stood all who saw them fall
> While men might count a score'?

In the latter case, the idea is that of counting the names of the numbers up to a fixed limit at a rate determined by habit or by the time which is required to pronounce the words distinctly. In the former case the object is perhaps not merely to let time elapse, but to set attention in a certain rhythm, so that the tendency of rhythmical anticipation may assist in seeing or hearing the starting signal at the moment it is given. For this purpose the periods should be exactly equal, and in fact at the Oxford boat-races every boat has some one beside it who counts aloud the last few *seconds* before the gun fires. Of course, finally, the names of numerals may be repeated, as any words may, without a meaning. But to do this is not to count.

Thus even simple counting always involves the elements of the judgment—of an identity exhibited in differences and affirmed of reality; which elements present themselves in the shape of a distinct unit within a continuous nature, its relation to which nature is indicated by number. And that the simple enumerative judgment is always singular follows from the nature of the unit, which is theoretically nothing more than the content to which we ascribe distinctness *pro hac vice*; in other words, the unit *is* the difference or part that is taken as distinct by one act of judgment, and it may be said that what we count in enumeration are primarily the acts of judgment, as acts of distinction and relation within a certain continuous quality.

Does it follow from this view that Number arises essentially out of the sense of time or succession? I answer, Not 'essentially.' The connection between number and succession is a psychological and not a logical question. If it is impossible for two related acts of judgment to be simultaneous, as we are naturally inclined to suppose that it is, then two enumerative judgments must always be successive, and in this sense enumeration may depend upon succession. Nor do I think that this connection is necessarily disproved by such observations as that perception can take note of six balls at once being dropped into a box. Such a perceptive judgment, in my opinion, is probably *one*, and applies the result of previous counting, as an attribute resting on experience, to the perceived content, just as we can judge the number of pips on a card from the mere form of the pattern which they make. So if we count by twos, fours, or more, I think that this is complex counting, the unit being the mass of two or four, known to be such by previous experience[1]. A *logical* order among the units, i. e. an order in which the apprehension of each unit has a place in the series conditioned by the separate apprehension of other units, is of the essence of enumeration, although a *material* order among them, i. e. such an order that a unit

[1] Vid. the Author's Knowledge and Reality, p. 92.

changes its value by changing its place in the series, is in contradiction with the essence of enumeration. Unless there is what I have called a logical order, we have no security that the unit as such is apprehended at all, and what we take for enumeration may really be an inference like that which detects from the pitch of a note the number of vibrations *per* second which generate it. But whether a logical order of succession can only be realised in temporally successive acts of apprehension, is a purely psychological question; the more so, that, as we have seen, succession and time do not exclude unity of judgment, and the acts of judgment which constitute an enumeration might even, like an inference, be brought under the head of a single continued state of consciousness. In any case, succession in time would be a mere psychical condition of number, following from the unity of the intelligence as forbidding (if it does forbid) two judgments to be made at once. There is no sort of ground for connecting enumeration with the apprehension of *equal* parts in time, unless the equality of such parts be the material purpose of the apprehension in hand.

Discrete and continuous.

β. It follows from the nature of enumeration that *the distinction between discrete and continuous magnitude and the opposition of number as discrete to space, time, and other kinds of quantity as continuous, rests on a confusion.* Number as mere names or mere sounds may be discrete, i. e. disconnected, but then it has nothing to do with magnitude, but is a set of mere words destitute of meaning. On the other hand, number considered as the vehicle of magnitude or quantity is both discrete and continuous; and the same is true of all quantity, as we saw in examining the comparative judgment, and it is the essence of quantity to be so. The distinctness of natural units such as reciprocally exclusive material things does not make any difference of principle. They, like all units, are numbered in virtue of a continuous quality or identity which pervades them, and every unit, though it may only be suggested by a mo-

mentary purpose, is, like them, a distinguishable part, within a whole or aggregate consisting of such parts. The books on a shelf are not merely discrete, and the inches in a yard or the units of weight in a gravitating body are not merely continuous; in every case the unit is a distinct or discrete part, and the sum is a self-identical or continuous whole. It is nonsense to speak of counting without saying what is to be counted; and in specifying what is to be counted we specify at once the nature of the continuity and the rule of the discretion.

Judgments affiliated to Enumerative Judgment.

ii. *Judgments affiliated to the Enumerative Judgment.*

The Enumerative Judgment is the root of all quantitative determination; and, as we have seen, all the matter of knowledge above the stage of pure quality is either in itself or in its conditions accessible to quantitative determination. But the judgment in question also contains, that is to say, *is*, though in a depressed form, the universal essence of judgment in the principle of identity and difference; and it is possible for this to be revived by one kind of abstraction into a different relation from that of unit and sum, as it is for it to be further specialised, by an opposite abstraction, into an idealised form of the latter relation. But before indicating the genesis of other types of judgment out of enumeration, we must glance at those which it necessarily generates, and which must be regarded as species of itself. These are, *α*. the Plural or Particular, and *β*. the Collective judgment.

The Plural or Particular Judgment.

α. The Plural Judgment, or the Particular of traditional Logic, differs in no essential respect from the singular. It is not however accurately described as a mere aggregate of singular judgments, and indeed this description does not explain itself, for is such an aggregate several judgments or only one? I cannot doubt that the plural judgment is a single act of thought, which determines a certain whole or aggregate, given at the moment, though, it may be, in process of modification, by an attribute or condition such as two, three, or some other number which expresses the reciprocal relations

of its homogeneous parts. Thus the plural judgment is not an aggregate of judgments, but a judgment about an aggregate. Therefore the number is to be regarded as a predicated content or determining condition, attributed to a whole consisting of the units which have been counted up to the point at which the plural judgment is taken. That the element of continuity, or designation of the whole whose parts are *to be* counted, must quarrel with a determination by any number short of this whole[1], and demand a continuance of the enumerative process, is only a case of what happens in every judgment of perception. Such judgments, as we have seen, never embody 'pure cases,' i. e. they never fit precisely into a groove of necessity, that is, a sequence of reason and consequent. There is always something relevant omitted, or something irrelevant retained.

Thus the particular judgment from the very first *implies* a *ratio*; and the implication may be so strong as to take the judgment out of the category of particular judgments and place it in that of collective judgments, e. g. '335 members of the House of Commons are Liberals.' As every one knows that the House of Commons contains altogether 670 members, this is just the same as to say 'half of the House of Commons are Liberals.' It depends for its meaning on a completed enumeration, and therefore is essentially a collective judgment. It may even be regarded as an instance of simple measurement, i. e. of *ratio* treated as pure historical fact, in as far as its purpose is to measure the voting power of the Liberals against that of other sections of the House. The Liberals and the whole House are equated in respect of numerical strength; the whole House minus half of the whole House = the Liberals. In short, as we have seen, the completed judgment of Enumeration passes into Measurement, though the idea of Measurement is prior to the act of Enumeration. If on the contrary we say that 'Two Cambridge men are coming

[1] See Knowledge and Reality, p. 65, and above, Introduction, pp. 54 ff.

down to lecture,' the number two is *prima facie* non-significant; the judgment tells us nothing of the ratio borne by two to the whole number of Cambridge men, nor even to the whole number of local lecturers. Nevertheless if we think of it, we shall see that either it was wholly superfluous to mention the number, or else some context or latent allusion must imply a ratio. Number has significance only by comparison with number.

The Plural Judgment is equivalent to the Particular of traditional logic in the form 'Some men are mortal.' There is no essential difference between 'some men are mortal' and 'four men are mortal'; the two assertions, if interpreted literally, belong to the same logical class. It will appear however below that this literal interpretation does not render the true meaning of the old 'Particular Judgment[1].'

But we must distinguish from the above a form which has been employed in quasi-numerical arguments, viz. the form 'Most men are mortal,' or 'The majority of the House of Commons that has just been elected is Conservative.' These judgments are not merely particular even in immediate appearance. They present on their very surface the relation to a collective judgment which we saw to be at least latent in every particular affirmation. 'Most' or 'The majority' means more than half; and when we speak of half or a quarter or any ratio we assume a completed enumeration of the whole. We must therefore now pass to the Collective Judgment or Judgment of completed Enumeration.

The Collective Judgment.

β. The Collective Judgment has of late been rightly distinguished from the Generic and from the Hypothetical Judgments, which correspond to the real meaning of the Universal Judgment known to traditional logic. It has been justly pointed out that the 'All' of mere extension or numerical totality does not really express what is intended by such an allegation as 'All men are mortal,' or 'All triangles have their three angles equal to two right angles.' In such cases complete Enumeration is inconceivable, and something

[1] See on 'Modal Conversion,' chap. 7, below.

quite different, viz. the universal connection of attributes which are not results of enumeration (for number is also an attribute) is really the matter affirmed. So far all is clear, and Logic has greatly gained by the distinction.

But when we come to erect a difference of kind, and to treat the collective judgment as purely on a level with the singular or particular judgment, and as in fact a mere aggregate of singular judgments, and as thus separated by an impassable gulf from the universal judgment; and when we further maintain that enumeration cannot warrant its own completeness, then we fall into difficulty and confusion. Even the Plural Judgment, as we saw, is not a mere aggregate of singulars.

The Collective Judgment I understand to be a judgment made about a definite group or limited class of individuals, which individuals are taken to have been exhaustively enumerated, or to be capable of exhaustive enumeration. It is not necessary that the individuals should all be together in space or time; it is not necessary that they should all exist or have existed with any specific degree of reality; but it is necessary that every one of them should be brought before the mind, or should be capable of being brought before the mind, in a distinct and separate enumerative judgment. Such judgments are 'All the books on that shelf are German,' 'Every horse that I have bought in the last three years has gone lame,' 'All the kings of England since the Conquest but three have died natural deaths.'

When it is said that such judgments as these are on a level with the singular or the particular judgment, I take it that we must exclude from the meaning of singular or particular judgment all dependence, whether latent or explicit, on completed enumeration; otherwise our account of the collective judgment becomes circular. But if so, then we have the 'allness' of the collective judgment staring us in the face as a distinction between it and the particular. And this distinction becomes an absolute severance if we

are to insist that the process of enumeration, a process which consists in singular and particular judgments, cannot furnish the warrant of its own completeness.

I have maintained elsewhere[1], and it follows from my whole conception of the judgment, that enumeration cannot be made intelligible on such a view. It is impossible for enumeration to go on apart from the discriminative control exercised by the pervading nature of the totality under construction upon the successive apprehension of the units. It is this control which takes the form of an inchoate perception of ratio as the counting advances, and of the warrant of exhaustiveness when it is completed. Apart from such an influence of the whole there can be no purpose in enumeration. No doubt therefore complete enumeration is in one sense on a level with the singular and particular judgments, because they present though in an imperfect form (as we have excluded the case of definite ratios such as 'Half A are B') the same relation to totality which the collective judgment completes.

But for the same reason it is impossible to justify an absolute separation between the collective and the generic or universal judgment. The collective judgment, we may say, must emanate from an enumeration of actual individuals, or at least of individuals actually brought before the mind, one by one. But how can we carry a genetic distinction like this into the interpretation of judgments whose actual content is precisely the same? It is the commonest thing in the world for a judgment to be taken as exhausting a group or set of distinct individuals, without resting in any way upon direct enumeration; in other words, a judgment that *might* be obtained by enumeration constantly *is* obtained in some other way. The fact is, that when we have gone beyond sets of individuals present to perception or within the power of the mind to represent at once as distinct individuals (and no one could possibly propose to limit the collective judgment to such sets of

[1] Knowledge and Reality, p. 77.

individuals), we have entered on a process which is plainly and obviously mediate and hypothetical, and the fact that many judgments thus mediated are taken to refer to a finite group of individuals is a mere instance of our general rule that every content in judgment is taken to have the reality of which it is capable.

Is there then no difference between a collective judgment and a true universal? Certainly there is a difference, and it is illustrated though not constituted by the connection of the former with complete enumeration. It is simply this, that a collective judgment deals with a content which can be presented to thought as possessing the character of an aggregate of exclusive units, or finite whole of enumeration. This point of view would involve identification of the collective judgment with the aggregate of singulars only if all enumeration were simple enumeration. But a numerical whole may be obtained by mediate enumeration, and it is to a whole so obtained that the content of many collective judgments is equivalent. It is true that a collective judgment is not a genuine universal, but it is not true that such a judgment must be equivalent to a mere aggregate of singulars. This conception is, in the first place, irreconcilable with the unity of the judgment[1]; and, in the second place, is not warranted by the plain meaning of the propositions in question. It is impossible to designate a number of individuals by a common name as the subject of a judgment without implying a significance in the designation. Even if the predication is true of the different individuals for different reasons, the common interest of the judgment must give it unity of purport. An arbitrary limitation either of number or of time tends, no doubt, to interfere with this significance, and to force an extensional

[1] No doubt there is a difficulty here. 'George and John have gone to school,' 'The two boys have gone to school.' Does the former sentence convey two judgments and the latter only one? The latter only one, certainly; the former conveys two at first sight; but if we bear in mind our account of the Judgment as an act in time, we shall see that these two may readily pass into one. See p. 85, supra.

meaning upon the judgment; but, as we know, the purest extensional meaning is only a minimum of intensional meaning. And there are collective judgments which could not possibly be taken as mere aggregates of singulars. Such are reflective historical judgments. 'All States of the North American Union are prohibited from interfering with the tenure of property.' I need not know this by simple enumeration; I may know it mediately, as a provision of the Constitution of the United States. I need not even be actually able to enumerate the States which are included in the Union. But I know that they are numerable, because I know that they are an actual limited group, and so I judge it as a historical fact, though I may know it also as rooted in the nature and tendencies of the Union.

The fact is, that superficial as is the view which makes 'allness' the adequate expression of logical necessity, it is if possible, more superficial to deny their connection. From the first use of the designative idea, necessity makes itself felt; and 'allness,' or the aspect of a finite totality as an aggregate of exclusive units, is never without a warrant and significance however arbitrarily the totality may be taken. It is by the certainty of complete enumeration that counting becomes, as was said above, the organon of precise measurement. For instance, the series of enumerative judgments, 'One, two, three, four, five, *six* ounces are in the scale balancing this packet,' is convertible, in virtue of their exhaustiveness, into the judgment of measurement, 'This packet weighs 6 oz.'

We saw that the act of counting tends to assume independence, as if it could have a meaning apart from any continuous nature in the units, i. e. in short, apart from an identity presented as a totality. This is not merely owing to the customary abbreviation of the enumerative judgment, as when we seem to count by saying 'One, two, three,' etc.; rather such an abbreviation is made possible by the apparently independent reality of number. This appearance of

reality depends on the fact that the numerical series does furnish a generalised scheme of the relation of whole and part when envisaged in the form of total and units. Such a generalised scheme, though meaningless except as applied to a positive content of thought, contains nevertheless definite and necessary relations which are imposed by it on any content to which it is applied; and the presupposition that it is taken as applied to an adequate content fades into forgetfulness that it need be applied to a content at all. But need it? We may surely investigate the numerical series for its own sake. When we say that twice 50 is 100, need we mean that twice 50 of some particular kind of thing are 100 of it? We may surely mean that in the numerical series 100 is separated from 50 by the same number of places as 50 from 0, which relation involves a variety of consequences, all true of the numerical series as such. No doubt this is so, but it will be observed that we have to appeal to the idea of places in the series, and these places are the abstractions of enumerative judgments and imply relation to a content. Such places contain in themselves no reason for stopping at any point of enumeration, are applicable hypothetically to every content, but can yield, in their abstraction, no conclusion about any. It is a well-known fallacy to obtain a concrete estimate by multiplying an amount by the number of times its cause as given has to be repeated. Hardly any concrete quantity is unaffected in the ratio of its increase by a great addition to its absolute magnitude. To say that the stock or trading capital of England is worth so many hundred millions sterling is a graphic expression for the fact that its amount is a million times as great as an amount worth so many hundred pounds. But in the economical sense of 'worth' the conclusion is nonsense. A thing is only worth what it will fetch, and who is going to buy the whole stock of England if thrown on the market at once, at the rate which is commanded by the amounts of stock which change hands in the common way of trade?

The numerical series is an ideal scheme of the relations of units within totals, but is itself unreal apart from its applications, not because it is ideal, but because it has in itself no element of limit or totality; i. e. its units make no choice between belonging to one total and another, and so naturally belong to an infinite series.

This aspect of the enumerative judgment—the system of number—leads to the consideration of complex counting and of numerical infinity. But before pursuing the enquiry in this direction I pause to indicate a reversion or convergence to which the simple enumerative judgment tends in its other aspect.

Enumeration becoming Generic. The Exhaustive Judgment.

γ. Every concrete enumerative or collective judgment bears reference to an identity which controls its selection of units and fixes the limit of its enumeration. This identity is the pervading nature of the units. Now if this nature consists in the characteristic quality of an individual thing, then it is possible that on the one hand it suggests no conceivable limit of enumeration, while on the other hand the characteristic individuality claims completion in respect of its positive connections of content. In such a case there is no true whole of repetition concerned; no whole, that is to say, which in its nature draws nearer completion by every repetition of an individual. The books in this room are a true whole of repetition; the human race, to our present knowledge, is not. Thus a problem which is first attacked by enumeration may transform itself unawares. Meeting with a series of individuals in which we perceive some important attribute, we enumerate them as cases of it. But soon their characteristic nature reacts on the function of thought, and we find our successive judgments attempting to grasp a connection of content and not to exhaust a sum total of cases. Now as enumeration is on one side selective analysis, we continue to give our judgments enumerative form, and even couch them by anticipation in the shape of exhaustive totality. Then we have what has been called Induction by simple enumeration, with its results embodied

in the Judgment of Allness, which to avoid an un-English expression I shall venture to speak of as the Exhaustive Judgment.

The most varied opinions have prevailed as to the nature and value of this process, obviously because it forms a transition between two distinct lines of thought, marking the revival within mere enumeration of the sense of characteristic individuality which belongs to the judgment of proportional quality and the kindred judgments of individualising thought. We meet, for instance, with the question whether the judgment 'All men are mortal' claims to represent completed enumeration or not.' The answer is that its form and its meaning are at variance; in form it does make this claim and in meaning it does not. Such a judgment indicates that the spirit of analogy and of characteristic quality has reawakened within the form of mere enumeration, and is sweeping the line of evolution back towards judgments which predicate individual and generic character. When we come to speak of Induction as a phase of Inference we shall see that there are good reasons for such an awakening. At present we have only to note that the exhaustive judgment 'All men are mortal' is a transitional form between a collective judgment on the one hand, and the generic judgment 'Man as such is mortal,' also couched in the form 'All men are mortal,' on the other hand; and arises from an incipient reaction of positive content upon ideal schematic form in the process of making number, before an external separation has been effected between the two elements. It is idle to demand the perfection of complete enumeration from the exhaustive judgment; for this latter is a popular and unstable form of thought, and must simply be recognised as such. It is better to treat the collective judgment as inevitably leading up to a connection of attributes and as therefore having its ideal in the spirit of the exhaustive judgment, than to interpret the exhaustive judgment according to the letter, as having its ideal in the collective judgment. We shall have to recur to this subject when

we return to the central development of the judging function.

We have now to trace the further abstractions which have their root in enumeration.

Judgment of Mediate Counting.

δ. On the side of the relations between units and total as such, abstraction being made from the positive nature of the contents submitted to enumeration, the judgment of completed enumeration is an ideal or generalised scheme of all possible constructions of such purely numerical totalities. It starts from a measurement or collective judgment of the type 'All the books in this room amount together to a thousand.' The further abstract development of such a predication may be brought about by the most various occasions, but it essentially consists in this, that the positive concrete units of enumeration which stand as subject in a judgment like the above are replaced by generalised relations of ideal units equated to a total which also becomes ideal and generalised. This substitution reveals the fact which alone makes it possible, viz. that in the numerical scheme all units, being abstract, retain the same value in every part of the series; e.g. the units between 50 and 60 count for as many as and no more than those between 30 and 40 or between 0 and 10. Thus a series of units may safely be named by the number of places which it occupies counting from the zero of the whole numerical series, but it is the same wherever and however often it recurs. It is on this characteristic of number that the possibility of mediate or complex counting and of equation, which is implied in these processes, depends. If, for instance, we desire to recompose the sum of books in the room by equating it to component sums or to factors, we do so by conducting a number of enumerations separately from the beginning of the numerical series, and then combining their totals according to the rules of that series, which are known to us simply by experience. Thus, if we count 700 English books, 200 German, and 100 Italian, we find that these sums, considered merely as numbers, are equal to the total

1000 obtained by direct enumeration. 'Considered merely as numbers,' because the rules of the numerical series cannot warrant us against any material influence of the actual individual things upon each other. Some of them may cancel each other, or may produce more by combination; but this has nothing to do with the properties of number, except for the fact that, when known, it is capable of numerical expression. The component numbers in the subject of a judgment like the above (These 700 English volumes with these 200 German and those 100 Italian make up 1000 volumes) correspond to the designative ideas in an affirmation like 'This execrable ruffian should be hung.' It is hard to say if they are general conditions, or if they are specifications of fact taken as true merely in the present instance.

But it is clear that in such enumerations we are on the brink of mediate counting, that is to say of the abstract equation $700+200+100=1000$, just as in the individual judgment mentioned above we were on the brink of the generalisation 'Every execrable ruffian ought to be hung.' '*Mediate* counting!' it will be said; 'then we are in the region of inference, and no longer in that of judgment.' It is certain that when we speak of necessary connection between attributes, of hypothetical or mediate judgment, we are in the region of inference; but it is not the case that we are therefore out of the region of judgment. By 'mediate' in the present connection I only intend to designate a judgment which has for explicit subject a generalised or abstract attribute, and being free from any demonstrative or sign of perception must be taken as conditioning its predication by that attribute. Such a predication is mediated, i. e. is affirmed of any particular individual only through and in virtue of the attribute expressed in the subject. Mediate counting forms the transition between ratio and proportion just as mediate measurement does. Logically speaking every equation expresses a ratio, and a ratio becomes a proportion directly

it is applied—directly its unit is taken as variable. Thus an algebraical equation, which exists with a view to a variety of applications, is *ipso facto* a proportion.

Complex counting is a case of mediate counting; that case in which we count by units which are themselves sets of numerical places, i. e. by multiplication and division, which may for the purpose be taken to include addition and subtraction. The only difference between multiplication and division on the one hand and addition or subtraction on the other is the equality to each other of the subordinate totals in multiplication and division, which enables them to be counted as units and their number indicated like any other number, by its place in the series counting from o upwards. In this sense multiplication is a mere abridgment of addition; it is only a question of form whether we say $2+2+2+2=8$ or $2\times4=8$. This latter equation represents what is essential as well in addition and subtraction as in multiplication and division, a total analysed into factors and a process. Complex counting, as a case of mediate counting, shares its abstract, hypothetical, and necessary character.

Abstract Counting and Infinite Series.

ϵ. The processes of mediate counting deal with the construction and reconstruction of any given numerical total. Even the quantitative relation of part and whole in its extremest abstraction retains thus much of structural unity, that, given a total of units, it can only be dissolved or reconstructed according to certain rules of combination or analysis. But the quantitative unit *per se*, or rather the one-sided abstraction of the quantitative unit, the mere numerical place which no positive identity links with the other places of the series, has in it no principle of totality or limitation, that is to say no reason for stopping short after one set of such places rather than after another. Enumeration of units as such may be continued at pleasure, and the process of so continuing it without limit is summarised in the conception of numerical infinity.

We have here tracked to its genesis this paradoxical conception, in its right place so powerful for good, and in

its wrong place for evil. It would not, perhaps, be beyond the province of logic to comment on its use in its right place, that is to say in mathematical science; nor could a more interesting subject readily be found. But lack of mathematical knowledge deters me from attempting such a comment with any degree of detail; for a logician is aware of the risk incurred by venturing beyond his knowledge, and as he preaches that there is no royal road to truth, must keep clear of the delusion that he himself has found one. But any one may offer a suggestion, and this I propose to do by saying that it seems to me most probable that the scientific use of the conception of infinity rests in every case on a justifiable neglect—justifiable, because that which is neglected has a known nature, and may be set down as insignificant either altogether or from the point of view of a specific purpose.

If, to take a coarse and non-mathematical instance, we set about any task in a way which is demonstrably perverse and inadequate, a looker-on is justified in disregarding our efforts. He will tell us that we shall not get it done in that way if we live to the age of Methuselah. Translated into logical phrase, his comment means that our way of going to work has not the element of totality; the successive efforts which make up the series of our activity, bearing no relation to the nature of the work to be done, do not include in themselves successive parts *of it*, and therefore, *as regards it*, have no tendency to come to an end and will (unless we choose to leave off) go on to infinity. We may even apply this illustration to a simple mathematical idea, say to the case of parallel straight lines. We may consider as the task to be accomplished such a change of direction in either or both of a pair of parallel straight lines that they should cease to be parallel to one another. And we may consider as the means adopted to bring about such a change the production of the two straight lines in their original direction. Then our supposed on-looker would say, 'You might go on for ever at that game;' 'You cannot change the

direction of a straight line by producing it in its original direction.' Therefore it would be justifiable to neglect the production of parallel straight lines to infinity, in other words to pronounce that such production cannot alter their character as parallel straight lines, i. e. that even if produced to infinity (which they can never actually be) they do not meet. Probably such a case as this would hardly be recognised as an instance of the mathematical use of infinity, but in as far as it introduces the conception of quantitative infinity as a term in a positive definition it would seem to be at least analogous to such a use.

More subtle and interesting are cases in which the continuance of the series makes a difference in the task to be performed, but the whole possible difference can be shown to fall within certain known limits. These cases, which I presume to be of the nature of infinitesimals rather than of infinites (both of which must fall under the head of infinite *enumeration*), may be reduced to the same class as the former if we reflect that in the former also the difference fell within known limits, but these were limits of *kind*, whereas we are now speaking of limits of *quantity*. In cases of this second type we know that a series could be continued to infinity, and that some difference would be made to the problem before us by this being done; but, on the other hand, we are aware of a limit within which the whole series must fall, and we are therefore able to pronounce that the difference which can be made by its continuance after a certain point is, at least for our immediate purpose, a negligible quantity. Such, I take it, must be the principle of any process which determines e. g. the area of a circle by treating it as between the area of a polygon inscribed in the circle and that of a polygon described about it. So far as I follow the exoteric utterances of mathematicians[1], the principle of abstraction based on a positive knowledge of the capacities of a series

[1] I have in mind more especially Mr. Spottiswoode's Presidential Address to the British Association, which unluckily I cannot refer to.

must be at the root of the employment of mathematical infinity.

But our immediate business is with infinite number considered logically, i.e. with a view to its general place in knowledge. And from this point of view we have to notice—

(1) That the idea of infinite number has its genesis in a one-sided abstraction, viz. in the notion of counting without having anything in particular to count [1], which corresponds to the idea of difference without identity, and of parts without a whole. By such an abstraction the enumerative judgment is destroyed, the essence of judgment as such—the exhibition of identity in difference or of the whole in its parts—being withdrawn from it; and the names of the numbers are turned into a meaningless repetition, the purpose of enumeration having disappeared. We are no longer saying 'One tree, two trees, three trees,' etc., but we are merely saying 'One, two, three,' and it is for this reason that we need never stop.

(2) Being one-sided, the idea of infinite number is self-contradictory. The essence of number is to construct a finite whole out of homogeneous units. The idea of numerical infinity arises from neglecting the continuous nature of the unit, and therefore omitting the element which alone arrests computation at one number rather than at another. Thus an infinite number would be a number which is no particular number, for every particular number is finite.

(3) It follows from this that infinite number is unreal. This does not mean that there may not actually be more units of one kind or another than we can count in the time at our disposal or in any finite lapse of time. The statement deals with the nature of number, not with the extent of the sensuous universe. If, to put a common idea coarsely, we are asked, 'Supposing that you *could* travel through

[1] A series which is *ex hypothesi* infinite comes under the head even if it seems to have a positive nature. For its nature *ex hypothesi* does not determine the number of its units.

space for ever, and never come to an end of it, must not space contain an infinite number of units? or even if you can go on subdividing a given portion of matter for ever, must it not contain an infinite number of parts?' to such questions we could only reply, 'Things or the parts of things may quite conceivably transcend our power to count. But except in view of a finite goal, number does not help us, does not tell us anything, grounds no ratio of parts to whole. We should in fact never give up counting any units that had interest for us, and should in doing so always be at some finite number. But if it could be miraculously revealed to us that there was no end, then I think we should stop counting, unless the units in question entered into subordinate or graduated totals which had an interest for us. Thus we go on counting the stars for definite reasons. Their relation to us is graduated, and several subordinate totals within their number have already been completed by enumeration; e.g. stars of the first eight magnitudes have been identified and counted. In counting them we have always in view some definable total to be constructed or to be corrected. Who counts the waves of the sea? The hope of complete enumeration is the justification of counting.'

Then why do we count the years and centuries? Do we pretend to know that they will have a numerable sum? and when they have reached it, do we imagine that the race will survive to take an interest in the completed enumeration? In the first place, for each of us time seems to have an end; and in the second place, all history is parcelled out in overlapping epochs which we have an interest in measuring. We do not in fact ordinarily know or compute the whole numerable series of years that has elapsed since the first events of ascertainable date in history; we adopt this or that era according to some overpowering historical interest which makes it seem to mark a fresh beginning. We do not count the years to ascertain their total quantity, but to give them names by

which we can fix events; and as a means to fixing the relations of events we no doubt desire to note the quantitative relations within the total of historical time which has elapsed down to any given present. If we are pressed further, and told, 'But, after all, the years may go on for ever and the human race may go on counting them for ever,' we can only reply that the faculties with which we are endowed refuse to express this 'ever,' that at any point taken in the series we should be at some finite number, and that if a conviction of the endlessness of the series could be miraculously impressed upon our minds we could only conclude that, except as a record of the past, counting the years was an unmeaning form, seeing that the nature of the series could not be represented in number. A very simple case of enumeration *ad infinitum* would be that in which, by persistent errors of identification, we should count the same objects over again, round and round, without being aware that we were doing so. In such a case it is obvious that the conception of number would be destroyed so far as these objects themselves were concerned, though if they were at known intervals of space we might none the less use them as a measure for other things. When we measure with a foot-rule we do in fact count the inches marked on it over and over again in this way, not for their own sake or the process would be infinite, but only for the sake of some other quantity which we characterise by them. In this respect the inch-marks on the foot-rule correspond to the physical changes which indicate the day and year, and which serve as a measure for occurrences other than themselves.

An infinite series, then, is not anything which we can represent in the form of number, and therefore cannot be, *qua* infinite series, a fact in our world. Relations may indeed be given as actual which only an infinite series could represent on their quantitative side, such as the ratio of the diameter to the circumference of a circle. But for this very reason they never are adequately represented on that

side, although we may know and argue from the positive character of the series, which *ex hypothesi* its prolongation to infinity is not to change. Our constructive judgment requires parts *and* a whole to give it meaning. Parts unrelated to any whole cannot be judged real by our thought. Their significance is gone, and they are parts of nothing.

Thus it is nonsense to speak of any definite number, say 100, as a portion of number, in the sense in which a foot is a portion of a yard, or a minute of an hour. The question 'what portion?' at once disposes of any such relation. Number as such cannot be identified with any particular total such that a given number is a definite fraction of it.

Closely allied to infinite number, and in a great measure depending upon it, are the conceptions of abstract or ideal time, and of abstract or ideal space, tending respectively to generate ideas of infinite time and of infinite space.

Abstract and Infinite Time.

ζ. In speaking of Comparison we saw that every 'now' tends to become a part within 'now' and 'then,' and every 'then' again within 'then' and 'then.' This analysis is very gradually brought about, speaking historically, in the evolution of the tense-system. The sense of Time is in the first instance the mere consciousness of continuity in succession, that is, the mere perception of *a* succession or process of change. This sense however being only possible through setting off the succession against a comparatively permanent background of consciousness, is in embryo the comparison of successions, with the development of which comparison measurement of Time, and with this the abstract idea of Time, are brought into existence. The measurement of Time consists in the equation of one set of perceptible changes identified by a common nature, to another set of perceptible changes, in the sense that the beginning and end of a numbered series of the one coincide with the beginning and end of a numbered series of the other. The enumeration of phases of one series that coincide with one or more phases of the other series might conceivably be undertaken

apart from any belief that either series has a constant duration in time, i. e. if repeated, would occupy the same amount of duration as before; but in enquiring whether such a belief actually exists we must distinguish between the reasonable doubt whether any portion of any series ever can or will be repeated absolutely without physical modifications which may affect its duration, and the unmeaning doubt whether a series assumed to be repeated without physical or causal variation may not nevertheless have varied in the absolute amount of duration which it occupied. The former kind of doubt will only lead to a demand for criticism and reciprocal adjustment of our time-measures, together with the temperate scepticism which our lack of exhaustive knowledge must produce about our acquaintance with even those natural conditions which we have most fully investigated. The latter kind of doubt, if pressed to its conclusion, would reduce the enumeration of successive changes to a statement of mere numerical fact wholly devoid of significance. Such enumeration would not be impossible, but would scarcely fulfil the requirements of judgment. It would be on a level with the mere repetition of the names of numbers. It is hardly necessary to give instances; every one can see at once that if we entertain the idea of variation in the measures of time occurring without any reason, all equation of successions becomes futile, and ceases to afford any ground of expectation or of inference.

But though a doubt of this nature has been mentioned by great writers, yet it has never been extended to affect the only element of our time-perception which is essential to its utility, viz. the constant ratio obtaining between the successions employed as measures of duration. This limitation of the doubt arises from the confusion in which it originates, the confusion which consists in treating the whole as if it were a part. Time, for us, is a relation, a ratio, and its constancy is the constancy of this ratio. If all processes in time maintain a constant ratio to one another so far as they are unaffected by physical modifications, then there is no

meaning in suggesting that tried by some unknown or impossible standard[1] they may be variable. But yet this suggestion is a natural suggestion arising out of a natural confusion. We naturally frame an idea of duration in itself, as that which has successive parts really and absolutely equal, because equality of successive parts *in terms of one of our time-measures* is what we are always endeavouring to ascertain from some other time-measure. And we forget that equality, if we exclude from it the idea of measurement, ceases to be an intelligible conception. This ideal of duration then, whose successive parts, though *ex hypothesi* not measurable, are assumed to be equal, we actually set up as an imaginary measure against the totality of consenting measures and processes the ratio of which to one another forms our world of time, and is merely represented in an abstract and ideal form by 'duration in itself.' 'Duration in itself,' says 'Locke[2],' is to be considered as going on in one constant, equal, uniform course. But none of the measures which we make use of can be known to do so; nor can it be assumed that their assigned parts or periods are equal in duration one to another.'

But 'duration in itself' not being a relation of successions, could not be perceived as time, nor could any being that perceives as we perceive be aware of equality or the opposite in its successive parts; for equation is necessary to equality. If, on the other hand, we set it against our time-measures, then it becomes one measure among many, and in case of a discrepancy that should remain unaccountable it is only caprice that could choose which we should regard as right. The question in fact would be unmeaning, for the whole discussion obviously originates in the attempt to transfer an attribute which depends on a comparison to a set of terms considered in themselves and apart from comparison, and then to suggest a comparison between them

[1] E. g. by measurement of successive phases against each other, which is *ex hypothesi* impossible.

[2] Essay, book II. 14. 21.

(the supposed equal parts of ideal duration) and the totality of our time-measures of whose reciprocal relations those parts are an idealised form.

But this confusion does not naturally originate a doubt of the constant ratio, physical disturbances being allowed for, of our measures of time *compared with one another*. For it is this constant ratio from which the idea of duration as such, hypostasised by abstraction into duration in itself with equal successive parts, is derived; and to doubt the constancy of this ratio would be to deprive ourselves of that idea of duration on which the confusion itself depends. If oscillations of a pendulum of fixed length, such as are normally equal when measured by the rotation of the earth, may vary without a physical cause affecting either of the compared motions, the conception of uniform duration is destroyed, and no equation of successions is more than an isolated fact. On such a hypothesis there would be nothing to generate the idea of uniform duration, and no measure of time with which to compare that idea.

The antithesis between duration in itself and our measures of it is merely a case of the antithesis between the thing-in-itself and our knowledge of it. It is possible, though unmeaning, to doubt whether our knowledge as a whole is real knowledge—i. e. corresponds to some test or condition which we may imagine as imposed upon it from without. The possibility arises from our possession of an ideal of knowledge, which by an act of abstraction can be set in antithesis to the actual whole of knowledge from which it is abstracted. But it is impossible when operating in detail upon the matter of experience to doubt the existence of rational connection in any one particular group of appearances; for by so doing we paralyse the understanding, which can only act in the search for causes, and leave neither knowledge to condemn nor an ideal by which to condemn it. We shall have to return to this subject in a later chapter, when we speak of the postulates of knowledge.

We have just seen that it is idle to treat the whole as if

it were a part—our reciprocally adjusted measures of time as if they were one measure among many. It is also worth while to observe in the same instance the impossibility of making a part do duty for the whole, which is strikingly exemplified in the ultimate data of time. No process of perceptible change is a trustworthy measure of time except in as far as it is equated with other processes of known constancy, and observed to be in itself free from physical causes of variation. That is to say, the part can only be taken as a definite standard when it has been criticised in the light of the whole. This is true of all premises of knowledge.

Amount of Time, like all quantity, is measured by the enumeration of units which have a known value. But, unlike any other kind of quantity with the exception of space, it follows number not only into mediate counting (all quantity does this), but into enumeration *ad infinitum*.

Simple enumeration in the case of Time gives such judgments as 'He died three years ago,' 'It is seven days since I saw him,'—which expand by reference to a standard of succession the mere indications—probably of various nature and origin [1]—conveyed by the tenses.

Mediate or complex counting in Time gives such judgments as the equation '365 days = one year.' Such judgments deal with our real and ideal time as the result gained by comparison and equation of actual processes in experience. But the abstraction which stands as subject tends to assert itself as a something apart from the actual processes whose relation it is, and thus as we have seen generates the conception of 'duration in itself' or 'absolute time,' which again having lost the element of totality precipitates us into the idea of infinite time.

Enumeration to infinity, when applied to the parts of time, has characteristics analogous to those of infinite

[1] Tense need not have originated in the idea of succession at all; and may often have arisen out of the expression of emotions or anticipations or out of the mere negation of presence as a perception of a certain kind.

number, but more striking, inasmuch as time is closely bound up with the attributes of actual existence. Infinite time is, like infinite number, an *unending whole*, which is a contradiction in terms. That is to say, we are prevented by the nature of our minds, if by no other cause, from attaching any meaning to infinite time as a quantitative expression indicating an aggregate expressible by enumerative judgments. Whether the problem (for so we must consider it) which is put before us in this form is capable of becoming, not a problem, but a fact, in some other form, is a question which does not concern us here. The instances which are alleged to show that an infinite series may be *given* point somewhat in this direction; I allude to such an instance as that of the relation between diameter and circumference. However this may be, it remains true that infinite time, *as a mere quantity of duration*, is a phantom generated by a meaningless abstraction.

But, as we asked whether there may not *be* endless numerable units, so we may be challenged to ask, May there not or must there not have been an endless chain of actual occurrences in succession? And if we are prepared to deny reality to every endless series, must we not first of all deny it to the actual world as in time, and we may add by anticipation of the next section, as in space? There can be no doubt that the relativity of events and appearances in time and space does involve for our minds an infinite progression in the way of referring one thing or appearance to another as its cause or explanation, or at least as in some way its determinant. We can hardly conceive that we are really counting in a circle, but our position is just as hopeless as if we were. Our ideas of reference, determination, causation, do not allow us to fancy a first event, a beginning of time, or a limit of space. On the other hand, so far as we can understand, it is impossible for such a succession as we postulate to be actual in the sense in which a known section of history is actual. It is not merely something more than we do construct as a whole; it is something the

essence of which is to be incapable of construction as a whole. We may say if we like that we are bound to think of such a succession as actual in the sense that it is a problem inseparable from the relativity of our world; but we cannot take the endless series *qua* endless as a positive element in our organised experience.

In dealing however with the succession of actual events having positive character and content we are in spite of their serial appearance on different ground from that of abstract time or equable succession as such. Actual events—the history of our world—have more in them than a mere series. We may say either that the world in time and space is not mere succession and externality, or that the real world which intelligent perception presents to us is not merely a world in time and space. The human mind and will are always busy in turning a series into a coherent and almost individual whole, projected more or less definitely on a scene of time and space, but not exhausted in its meaning by the nature of that background. Greece for instance or England are not mere 'geographical expressions;' and if they were they would still have a physical unity of a deeper kind than the juxtaposition of extended units or the sequence of a series. They are historical realities, but their coherence lies in their meaning. Therefore in denying that for us, in our way of understanding, an endless progress can be a real and controlling factor of organised experience, we do not deny the reality of the phenomenal world *as presented to intelligent perception.*

Abstract and Infinite Space.

η. The nature of Space is in many respects analogous to that of time, and bears on the whole a similar relation to the system of number, with its degrees of simple or categorical counting, mediate or complex counting, and counting *ad infinitum.* The corresponding grades of abstraction in dealing with space may be identified as—

a. The measurement of actual distances.

b. The theoretical relations of spatial qualities, including the whole of the mathematical sciences, excepting what may

be included in the mere system of number, viz. all forms of simple and generalised (algebraical) arithmetic; and

c. The conception of infinite space.

In defence of the subdivision here adopted, I venture with a good deal of diffidence to suggest that the idea of infinite space is not an idea belonging to geometrical science. The employment of the idea of infinity in geometrical reasoning belongs, if the account above given of it is correct, to the second of the above heads, being really an abstract mode of describing a geometrical whole. If enough space is given to make manifest the positive nature of the whole before us, it would seem that no addition can really affect the case. Quantitative infinity may be a roundabout description of a direction or a quality. That a certain straight line is infinite may only mean that its direction is such that it can never meet a certain other straight line.

Measurement of actual distances.

a. The measurement of actual distances is *prima facie* a case of simple measurement, and must obviously arise at the point where positions distinguished by the comparative judgment are discovered to have relations of distance and direction reducible to degree. Degrees of distance from assigned points, and proportions of such degrees, considered as properties of objects, pass into the determination of concrete individuals and of their characteristic attributes. In this respect we have considered them above. But also, receiving their significance from a system of equations by which all spatial magnitudes are brought to a common denomination, they contribute to reflection upon space in the abstract, a reflection which is developed by the process of enumeration applied to the parts of space when thus idealised and considered for their own sake. The system of measures, as we have seen above, is a connecting link between simple and complex measurement. It is *prima facie* a system of ratios, and requires an arbitrary starting-point to give it meaning. But when taken as general and typical it passes into a system of proportions,

as we see in such a judgment as 'This map is on the scale of twelve inches to the mile.' There need not be twelve inches in any direction in the actual map before us; the phrase expresses a proportion, not a simple fact of enumeration. It is not necessary to know, for the purpose of the scale, how much absolutely (i. e. in the mass of other relations) an inch or a mile is; we can interpret the scale if we know how many inches there are in a mile. The abstract numerical expression 1 : 63360, which is a *proportion* as governing the relation between every part of the map and the corresponding part of reality, represents what the formula 'one inch to the mile' really means to say. We may compare this case with the financial expression 'five per cent.'; some newspapers *will* print this as £5 per cent., which is a confusion between singular or merely actual, and generalised or proportional ratio. They do not really mean that £5 need be concerned; their predication is as true if the interest in question only amounts to five shillings. The expression five per cent. is simply a fractional or proportional expression.

Now, when, e. g. in the two instances just quoted, the reference to an arbitrary magnitude is dropped out, and when moreover the generalised equation is taken as expressing the relations between distances in space combined in a certain way, then we have ideal or mediate enumeration as it exists in geometrical science. 'Mediate' because the proportion contained in the equation is affirmed of reality as qualified by definite spatial attributes, which therefore enter into the content of the equation as interrelated conditions. The equation of an ellipse is a hypothetical judgment asserting that the axes of an ellipse (or other quantities involved in an ellipse) being treated in a certain way will be always equal to themselves treated in a certain other way. It is obvious that being mediate this geometrical enumeration or computation is also complex [1]; for the conditions by which it is mediated may involve

[1] See p. 172 above.

units of any degree of numerical complexity. Thus judgments dealing with squares and cubes, still more with conic sections, presuppose, *on their numerical side*, more or less elaborate enumerative processess as involved in the formation or apprehension of the spatial unit.

b. The generalised relations of spatial attributes form a systematic science with a distinctive object-matter. Geometry.

(1) 'Any two sides of a triangle are together greater than the third side.' 'Triangles upon equal bases and between the same parallels are equal to each other.' 'The square of the hypotenuse is equal to the squares of the containing sides.' 'The angles at the base of an isosceles triangle are equal to one another.' Individuality of Spatial Figures.

Such judgments as these are among the simplest results of mediate enumeration[1] as applied to space, and they present an obvious peculiarity shared with them in a high degree by complex judgments of mere number, and in a less degree by judgments that compute time. Although geometrical science proper consists, as a science, exclusively of the equation with each other of variously described spatial units, which, if we further consider the sciences of motion, we must take as referred to units of time, yet under this 'variously described' there lurks a whole classificatory science of forms possessed of structural unity and quasi-organic relations between part and whole. Thus in the definitions and definitory judgments of geometry, as in the inductive judgment of enumeration, there is a revival of that structural subordination of part to whole which, though dormant, yet is never dead so long as judgment has a meaning. The triangle, the square, the circle, the ellipse, though each of them capable of being exhaustively defined by generalised enumerative processes dealing with homogeneous units, have also an aspect of structural unity and subordination of parts to the dominant quality of the whole. Both clauses of this statement are however subject to reservation.

[1] For the further distinction between arithmetical and geometrical reasoning, see Bk. II. ch. 2.

In the first clause, the expression 'homogeneous units' is not entirely adequate to the facts. Distances in the three spatial dimensions are indeed as distances homogeneous, but it can hardly be said that an angle is homogeneous with a distance or direction, although a proportion of distances is an exhaustive measure of an angle. Therefore, though an angle may be represented in terms of distance, yet in considering the elements in the spatial structure of a square or triangle we must assume the angle as well as the straight line. The apprehension of converging direction is hardly given in the mere apprehension of direction.

In the same clause we must qualify the assertion that *all* geometrical shapes can be exhaustively defined by equation of quantities. I presume that the impossibility of squaring the circle implies a difference of kind between circle and straight line which is disguised but not destroyed by the efficient methods employed to express the one in terms of the other[1]. Here again, in the adequacy, as distinguished from exhaustiveness, with which quantitative equations represent characteristics of kind not wholly reducible to quantity, we find an analogy with the various systems of necessity which are superimposed upon one another in the organic and moral worlds.

And the truth of our second clause would be a good deal interfered with, if not annihilated, by enlarging our list of geometrical figures, and by regarding every figure in all its possible variations. As to the first point, every spatial figure is a geometrical figure; and those which we mentioned, together with others that occur to the mind at once as commonly considered in plane and in solid geometry, have no real prerogative of existence to the exclusion of trapeziums or any other irregular figures, even if partly curved and partly rectilinear in outline. The world would be easier to explain than it is (or so it seems to a superficial glance) if irregularity, ugliness, and disease did

[1] The quadrature of the parabola shows that the impossibility of squaring the circle does not arise from the mere difference between curve and right line.

not, as they do, exist by law and necessity[1] just as much as symmetry, beauty, and health. It may be said in defence of treating the regular figures as if there were no others, that all others are reducible to them,—all rectilineal figures to triangles, and so on. But this is a mere ideal reduction by measurement, and in no sense a deduction of the existence of the one from that of the other.

And again, most 'figures' of which we speak are really classes of figures, even if we take all 'similar' figures as the same, i. e. disregard size and only look to characteristic proportion. I do not know why we should not take the conic section as 'a figure' and treat the circle simply as a case of it. Anyhow the ellipse comprises in itself a whole class of figures which are qualitatively quite different from each other, and pass by imperceptible gradations into figures which are not elliptical. By insisting on facts like these we might melt away the individuality of typical figures, and exhibit every group of geometrical shapes as destitute of common characteristics beyond those which flow from the mere genetic relation itself. Thus, for instance, an ellipse when just passing into a circle or into a straight line has none of the characteristics which we associate with elliptical form, although the analytic relation by which its nature is theoretically determined may be within the limits which must as a matter of geometrical classification be assigned to that figure. Such a treatment would be the triumph of explanatory theory and necessary connection over individuality and characteristic quality. But it is a treatment of which, in geometry, the facts admit, and which even in the organic world is rendered indispensable by the idea of continuous evolution.

It is right that attention should be drawn to the above reservation. No habit is more pernicious than that of assuming what is obvious and familiar in a certain sphere

[1] I do not say by the same necessity; I only mean that they result mechanically from natural conditions. Any limitation of which this statement may be capable must refer to a distinction of kinds of necessity.

to exhaust the contents of that sphere. Every figure is geometrical; and even if all irregular figures can be reduced for purposes of reckoning to the more regular types, this does not justify us in speaking theoretically as though there were no figures in space besides those which have been selected as typical by geometricians.

We must meet such conceptions now as we shall have to meet them again, perhaps more than once, in the evolution of the judgment, by the reflection that one positive existence cannot, by the mere fact of its existence, cancel another. There may be non-elliptical ellipses, figures which fulfil one set of conditions that mark the ellipse, but lack attributes without which we hardly recognise the figure; and there may in the same sense be or have been (time makes no difference) non-human human beings. And explanatory theory may be able in both cases to trace step by step without *saltus* or miracle the transition from the one phase into the other by development of elements fundamental in both. But this will not obscure our perception of the elliptical shape of a characteristic ellipse, or of the humanity of a typical human being. The typical human being is made typical, as we shall see, by real teleology. The typical ellipse is only typical through a subjective quasi-teleology. This is the difference between the two cases.

Thus, in spite of the above reservations, it remains true that in complex enumeration as applied to Space the antithesis of individuality and necessity is strikingly illustrated. A generalised relation of distances, not obviously differing in kind from any other generalised enumerative relation, when interpreted into an actual figure, *may* at least produce a structural totality complete in itself and of a marked individual character. It is enough to mention such simple instances as the equilateral triangle, the square, and the circle. These totalities do not refer outside themselves for definition in the obvious sense in which simple magnitudes are forced to do so. They are primarily cases

of internal proportion, of proportion, that is, between one and another element of a single totality. Relativity appears in them in another shape than that of simple equation with absolute (in the sense of arbitrary) standards of magnitude. A particular triangle or ellipse is relative and finite chiefly in the sense of being derived from arbitrary conditions, no one value of which has any prerogative of existence as against any other, and an extreme modification of which will always destroy the essence of the figure. There is also a further sense in which all natural existences are finite as compared with mind, because they cannot refer to themselves, but only *are referred* whether to themselves or to external conditions.

The subordinate totalities of Time, such as the hour, day, and year, are not really cases of the same principle, for they are mere aggregates of units without a limiting totality, and are simply formed by arresting enumeration at intervals prescribed by external interests. A better parallel may be found in the numbers of the numerical series which are distinguished by any peculiarity, e. g. prime numbers, squares, cubes, etc., if we consider these peculiar cases in their relation to the one unvarying process of adding together homogeneous units. This simple synthesis of number may be regarded as analogous to the mechanical or necessary aspect of an individual thing or figure, and its peculiarity as square or cube to structural totality.

Existence of Figures in Space.

(2) Figures in space then, and numerical relations, although abstract and ideal, and arbitrarily selected out of continuous sets of value of which no one has existence by preference to the other, yet seem capable in a sense of possessing characteristic quality and self-sufficing totality. What is to be thought of their *existence*? Do such judgments as are mentioned on p. 187 involve the assertion that the qualifications of Reality which form their subjects are actual, and if so, in what sense are they actual? The difficulty of the question is only displayed in its true extent if we add to the above instances some ideas for which actual existence, as diagrams in books or as thoughts in the

minds of individual students, cannot with probability be claimed; e.g. the idea of a polygon with a thousand and one equal sides, of any trapezium chosen at will, or of any irregular figure or high number.

It is clear that the square or triangle *qua* spatial figure has no actuality which does not equally belong to all such less familiar shapes, and therefore mere presence in the individual mind is not the existence in question. And indeed to speak of it as such would be to enter upon a vicious circle which would stultify the judgment; for it is essential to the judgment to affirm a reality outside itself, and it would be too ridiculous that your judgment should refer merely to the content of mine as the reality asserted, and mine in turn to that of yours. It is obvious that the two manifestations of the thought-function are on a level, and if each refers to the other, each might just as well refer to itself, i.e. find its truth in the simple fact that it is made[1]. A triangle must be just as real when no one is thinking about it as when many students are engaged upon the conception of one. This is of course not the same as to say that spatial figures do not depend on the spatial consciousness, or on consciousness at all. We are only saying that they cannot depend for actuality on one particular reflective consciousness of those particular figures. The world as it is for perception and intelligence is the object-matter of our whole enquiry, and we have no occasion to raise a question that assumes the destruction of the object which we are considering.

The absence of material existence and also of any mode whatever of particularisation in determinate forms (the selection e.g. of a typical ellipse not being justifiable on purely geometrical grounds) must however make a distinction between the actuality of the contents under discussion and that of material things or their sensible

[1] Reference to the world of meanings or objective reference (Introduction, sect. 7) is not merely reference to judgments in fact made by others. It is an inadequately conditioned reference to reality.

properties. Admitting, as we must admit for logical purposes, that Space is to be reckoned with as having a peculiar actuality of its own, still it is not clear in what relation geometrical figures, apart from the shapes of actual objects, stand to actual space. Geometrical figures as such, the subjects of judgment in geometrical science, are not the shapes of actual objects; they are not identical with any perceptible figure; they are not distributed through space nor present as special characteristics in any portion of it. I do not know how to describe them better than as a peculiar class of *laws* or *attributes* of the spatial relation as such, which are concrete in the nature of their content, though abstract in their medium of presentation. And in the same way the characteristic totalities of number must be taken as laws—embodied laws—of the enumerative relation of part and whole.

We may illustrate the nature of such attributes by comparing them with any purely imaginary ideal content which bears (so far as an imaginary content can, for it is always, in my opinion, found wanting somewhere) the character of self-sufficing totality. Such an ideal content for instance is Shakespeare's Hamlet[1], or the material spheres of ancient astronomy, or, to come nearer to our present subject, the conception of 'Flatland' as space in two dimensions only, with sentient beings confined to it. These conceptions, though doubtless based on elements of fact and illustrative of real conditions, yet exist only in the minds of those who read and think about them, or more strictly in the identical reference which these minds are stimulated to make to a world of meanings, but a world of meanings *explicitly* discontinuous with and detached from the actual world of fact, or what we call in short an imaginary world. Such a world is indeed maintained by judgment, but it is judgment of a peculiar kind

[1] Omitting the considerations which arise out of the artistic truth of the conception, and taking it merely as an illustration of an imaginary idea.

and under peculiar conditions—subject, not like the common world of meanings to a wholly indeterminate, but to a *conscious* and explicit, abstraction from reality, which becomes semi-conscious in artistic fiction, and utterly lost and obliterated in mere error and superstition.

The figures which represent the properties of actual space are not imaginary in this extreme sense of the word. It might however be a question whether the difference between them and such ideas as have been mentioned is one of kind or one of degree. Both kinds of ideas it might be said involve abstraction from concrete perceived reality, both kinds are therefore hypothetical and not actual existences, and how far the abstraction is carried cannot be a question of principle. Nor, I must add, do I mean to insist on the manifest *contradiction* with experience, or self-contradiction when viewed in the light of experience, that some of my instances of imaginary ideas may be held to present. The distinction which I desire to draw is simply between abstract but real, and purely imaginary contents, when employed as subjects in judgment.

Perhaps the distinction might be found as above suggested to consist formally in the *nature* of the abstraction to which the two kinds of contents are severally subject. A merely abstract content is subject only to the abstraction which its ostensible nature implies. The name of a figure in space is the name of a figure in space and not the name of a man or a mineral or of any material object. But the name of Hamlet for instance is and yet is not the name of a man. The name of a knot tied on an endless string is and yet is not the name of a reality in space. These imaginations are subject not merely to the abstraction which separates every content from all that is not included in it, but to a further abstraction which says, 'This is *a* meaning, but not *the* meaning you would take it for:' in other words, it is conditional within a world which itself can only be predicated conditionally and not directly of the reality with which we are in contact by means of perception.

Thus we may say, if we choose, that our ideas of actual space have for their meaning only possibilities, but these are at least *real* possibilities, that is to say, their fundamental generating relations actually exist in the world which centres in present perception. They are therefore as real as colour in the dark or as sweetness which we do not taste. And if we pronounce these attributes unreal outside the moment of perception, we have laid the axe to the root of the perceptible world. We might as well say that the wall in front of me is actual and that behind me is not. But what corresponds with these ideas to the actuality which colour and taste do partake of when perceived? Here we find a real difference. Such actuality in sensuous presentation they cannot have. But we do not of course admit that Reality is restricted to sensuous presentation. All we can say is that in all relations of actual things these spatial attributes make themselves evident as controlling conditions, and are introduced as conceptions without which the mind fails to construe the phenomena. They are abstract characteristics of the actual spatial relations of things, and are as much a fact for logic as any secondary quality, *qua* general quality; and they are not on a level with mere imaginations and fictions, even if these are consistent, or not notoriously inconsistent, with reality.

The quasi-generic judgment.

(3) The judgments mentioned on p. 187 are thus found to display in their own line of abstract evolution which we are now pursuing a character analogous *mutatis mutandis* to that which the Generic Judgment will be found to display in the concrete evolution of thought. The subject of each such judgment is Reality qualified as a structural whole which embodies properties rooted in an *actual* relation and controlling the consequences of that relation at every turn. The figures in question do not claim sensuous particularity and are not capable of it. The judgment therefore is a degree less generic and more hypothetical than classificatory judgments which retain much of the meaning of the collective judgment.

Yet the judgment in question *is* generic. In the first place, the particular figures which arise if particular conditions are assumed are individual totalities, not indeed having sensuous singleness, but self-identical as laws of space. And in the second place, although no doubt any series of such figures (triangles, ellipses, etc.) is in one point of view an infinite series (the transition from value to value of the generating conditions being absolutely continuous), yet the whole falls within known limits, and is bound together by a characteristic quality which might probably be found to vary with the variations of the generating factors[1].

Therefore a judgment like this presupposes, *not* as do the judgment of zoology a limited even if very large number of actual individuals forming a real historical unity though spoken of mediately and by help of an abstract qualification of Reality, but a series of laws regulative of form, or rather a law expressed in a series of forms, having positive common characteristics and bounded by definable limits within which the whole series must fall. 'All triangles' is hindered from meaning every particular triangle (i. e. variety of triangle——I abstract from particular sensuous presentations all through this discussion) not only as 'all men' is hindered from meaning every particular man, by the *practical* impossibility of dealing with such a meaning, but also by a theoretical absurdity, for all particular triangles would be an infinite series, which need not theoretically be the case with all particular men. But, as we saw above, a series which has a known positive character or falls within known limits may be treated as an actual unity in spite of its infinity. 'All triangles have their angles equal to two right angles' is a judgment about what is really a single continuous relation, but embodied to the mind's eye in certain

[1] It seems obvious that as one generating factor, e. g. one axis of an ellipse, approaches disappearance, we should expect the characteristic quality to diminish. But any such conception is not easy to carry out. E. g. if we take equality of the axes as the characteristic point in a figure of the conic section class, we get the circle as the characteristic type to the exclusion of the ellipse. The question has perhaps only an aesthetic interest.

salient types resulting from geometrical classification. It resembles the generic judgment more strikingly than appears at first sight, for the generic judgment too deals with a section of evolution in which a vast though not infinite array of transitional types has really bridged the gulf between the marked species which are familiar.

c. Infinite enumeration applied to the parts of space is the last result of abstraction in this region. Here, as in time and number, we have the idea of the absolutely homogeneous part, i. e. the part whose repetition has no tendency to generate a whole. The idea of infinite space is the idea of the endless synthesis of such parts, which must always present to us the appearance of an unsolved problem. If the problem has a solution, it must consist in changing the point of view from which we regard it, as if, to repeat an illustration which I employed above, we were suddenly to awake to the fact that we had been counting parts extended in a circle and not in a straight line. Infinite space.

Will not the doctrine known as the subjectivity of space and time help us to explain the nature of this contradictory reality? Up to a certain point it has undoubtedly done good service by showing that the difficulties which attach to sensuous reality are rooted in the nature of the percipient intelligence itself, and must be reckoned with as inherent in sensuous experience. But I am unable to see that the 'subjectivity' of these forms of apprehension can carry us further, unless or until we are enabled to put something better in their place. At present we seem only to have learnt that the difficulties of knowledge are not external to it, but are inbred and inevitable, at least so far as concerns the series of sensuous phenomena. But we gain nothing, so far as I can understand, by attempting to erect a world beyond as a non-sensuous counterpart of the sensuous series. If a counterpart, then it would seem to share the difficulties attaching to this series, while as non-sensuous it lacks the compulsory reality of sense-perception[1]. Our

[1] Lotze has well brought out the difficulties attaching to the conception of

present knowledge rather points to the conclusion that *if* we are to attain something less contradictory, more capable of self-sufficing reality, or if we like to use the phrase, more above sense, we must look for it in facts and purposes which deepen the significance of life, not in a shadowy counterpart which repeats the world of sense without enhancing its value. Mere series, mere space and time, we must always remark are mere abstractions; and though no human knowledge is free from relativity, i. e. from the reference to what falls outside it; yet on the other hand no actual human knowledge is, like the abstract infinities, mere relativity and nothing more. There would be some justification for saying that, as *contrasted with the concrete structure of individual things*, a 'subjective,' i. e. artificial and unreal, character might be attributed to number, space and time as infinite wholes; on the ground that they conflict with the nature of actual fact however comprehensive, and that the extension to infinity deprives them of relation to the phenomena in which they are known to us. But the distinction is hardly sound, for it is at best one of degree. The difficulties of relativity do not wholly cease as soon as we turn away from the abstract infinity of mere number, time, and space; in common ideas of causation they affect the actual content of phenomena. From the very beginning of knowledge, as I have tried to point out, Absoluteness co-exists with Relativity; but it is impossible to form categorical judgments of a comprehensive type until the idea of causation has been freed from its primary implication of an endless series.

The question might be asked, why are we exclusively tempted to demand the reality of infinite time and infinite space when there are other abstract conceptions of homogeneous parts not subordinate to any whole, which might in the same way be pushed to infinity? In the first place, it may be replied that abstractions of this class are not so common as might appear. The essence of them is that

an 'intelligible' counterpart to the world of sense. The strange thing is that they do not appear in any way to make him discontented with that conception.

progressive enumeration shall not tend to modify their character. Thus intensive quantities, such as infinite force, infinite velocity, are conceptions of a heightening the later stages of which would modify the earlier and not remain indifferently beside them. Therefore although the phenomena of velocity or of force do suggest the idea of quantitative infinities of those kinds, yet they do not impel us to judge those infinities to be real, because the perceived forces do not in their nature refer to and presuppose infinite degrees of themselves, but rather each manifestation *per se* excludes the infinity which would involve a qualitative change in itself. Infinite force or velocity is as contradictory an idea as infinite space, but is not in the same sense a problem or a paradox, because it does not in the same sense claim reality.

And secondly, Space and Time may be called the Categories of sense. That is to say, they are the only principles according to which the world of sense-perception, both of our own immediate feelings and of external objects, appear to us to be possible. The question is not merely whether we can imagine the absence of either or both. I take it that experience would reply to this by saying that we cannot *seriously* imagine (i.e. conceive with full consideration) the absence of either *in a world of sense-perception*[1].

But the real point is not merely psychological, although of course in dealing with it we must appeal to facts of the mind. The point is that the very character and essence of sense is isolation, and therefore in apprehending variety, series. So extreme is this character of isolation that the presentation of sensuous contents even as a series is due to an intelligence that goes beyond sense. Space and Time

[1] Psychologically speaking, I should suppose that we may lose consciousness of either, perhaps more readily of space, e. g. when listening to music. Time is perhaps the more importunate of the two ideas because it extends to our inner feelings, etc., and I suspect this to be the reason of Lotze's notion that time is more 'objective' than space. Yet we may of course in a fit of absorption lose consciousness of time. I do not suppose that these half-illusory states are at all perfect in their neglect of the non-obtruding element.

are *for us* the first work of knowledge, as the conquest of them is the second. But all we are concerned with here is that, *assuming the impulse* to construct out of our sensuous perception a whole *of the same nature as itself*, we cannot but attempt to erect space and time also into wholes, an attempt which is frustrated as we have seen.

Mechanical view of Universe.

iii. But, lastly, reflective science in pursuing an analogous attempt does meet with analogous difficulties. It assumes as further characteristics of the sensible world the abstractions of matter and motion. Matter and motion are the abstractions in which the sensuous world is reduced to homogeneity in order to be susceptible of quantitative treatment, and in this treatment they are able to a large extent to represent genuine and actual relations of that world. In this respect they correspond to the structural classifications of geometry, and form the content of mechanical science. It would hardly be true I suppose to say that the infinity of matter and motion in space is an inevitable paradox to the scientific consciousness. It appears possible to conceive of the universe as a coexistent finite mechanical whole, demanding no determination from without. But this is only because the determination from without is thrown back in time by the doctrine of the eternity of motion, which, with a similar doctrine applied to matter, introduce the infinite series under the guarantee of the law of causation. Here again we have the insoluble problem which arises from the relativity of the sensuous world and presses upon us in its naked form as soon as, by reduction to homogeneity, the element of absoluteness or totality which helped to balance it is destroyed. It is to the latter element that we really look for a solution in the degree in which it is possible. The infinite series cannot itself be reality, but so far as we can transmute the series into an articulated whole, so far we can gain a reality out of it.

This distinction suffices to justify the well-grounded conclusions of science respecting the past and future of the material universe. Such conclusions are contributions to

the projection that forms the actual world in which as percipient and intelligent beings we live. But with eternity in the shape of infinite regress and progress such a projection can have nothing to do.

We have thus traced to its climax in mechanical science that form of identity and difference in which an identity is regarded as the sum of the differences in which it is presented. This one-sided aspect of identity and difference is what takes the shape of whole and part in the strict or quantitative meaning of those words, the meaning in which the whole is taken as equated to a relation, whether particular or generalised, of homogeneous parts.

It naturally occurs to us to ask at this point, how, if quantity is homogeneous, and if *proportion* is, as we have reckoned it to be, generically a quantitative relation, the concrete individual (vid. p. 135) whose characteristic quality takes the shape of proportion differs *in content* from a relation in number, figure in space, or system of motions which, though purely quantitative, is also, as we have seen, characteristic and self-contained. In the first place, we have spoken of the quasi-individuality which does attach to the structures that embody geometrical and, we may now add, mechanical laws. And we must remember that their quasi-individuality is only made possible by a certain revival of the qualitative element within the whole of quantity, even if the quality so present throughout the parts is, like the curvature of a circle, constant in all of them. And in the second place, we have to point out that in a *true* concrete individual its individuality exists in the form of a conscious purpose, a real teleology, and is the cause of its homogeneousness, the proof of this being that if the elements are isolated and removed from the individual they fall back into disparateness. The proportion in which its parts are held together is as we saw[1] secondary and not primary; it is a proportion between proportions. And though it is true that in the

[1] See p. 139, above.

simplest forms of comparison, such as matching a colour, judgment and equation are hardly to be distinguished, being in fact as yet in their common germ, yet the peculiar secondary unity of a complex whole characterised by internal proportions is not fully expressed by reciprocal equation of its elements. Thus the concrete individual is from the first characterised by rather than equated to pure quantitative relations of parts. With abstract totalities just the reverse is the case. Their elements, homogeneous to begin with, are placed arbitrarily in any whole (in as far as the elements of various curves resist such construction they are not pure quantity), and only acquire the semblance of a relation to a whole by their non-resistance in such a construction *ab extra*. In the former case the *differences* involve the character of *parts* as the concrete involves the abstract; thus head, arms, legs in a man have quantitative relations to each other and to his whole figure, which vary only within narrow limits, and which sculpture or painting must not violate; or again, his whole life is only possible subject to definite quantitative relations of energy supplied to work done. In the latter case the parts, indifferent in themselves, are forced by construction into the function of differences. The reservations to which this last assertion is subject have been explained above (see pp. 187–8).

Thus equation and judgment are no doubt closely related in their origin; and this is further illustrated by the facility with which judgment drops back or crosses into the equational form, which demands altogether less effort and insight than the attempt to grasp the differentiated structure of things. I cannot refrain from quoting in illustration a paragraph from a powerful and sensible writer whose one fault is the love of moving in the lower categories and avoiding the effort to grasp entire realities as they are. 'As to the general result[1] [of human progress] what is it? Say, roughly, three hundred

[1] James Fitzjames Stephen, Liberty, Equality, and Fraternity, p. 177.

million Chinese, two hundred million natives of India, two hundred million Europeans and North Americans, and a miscellaneous hundred million or so,—Central Asians, Malays, Borneans, Javanese, South Sea Islanders, and all sorts and conditions of blacks; and over and above all the rest, the library at the British Museum. This is the net result of an indefinitely long struggle between the forces of men and the weights of various kinds in the attempt to move which these forces display themselves. Enthusiasts for progress are to me strange enough. "Glory, glory: the time is coming when there will be six hundred million Chinese, five hundred million Hindoos, four hundred million Europeans, and Heaven only knows how many hundred million blacks of various shades, and when there will be two British Museums, each with a library."' The numbers here are not merely descriptive; they are essential; otherwise the element of progress could not consist in their augmentation. Of all instances that show in what thin abstractions a writer who prides himself on contact with realities may live and move, I know none more grotesquely striking than this; and it cannot be defended by suggesting that its absurdities are in some degree imputed rather than adopted. For they can only be so imputed because they are adopted. The faith in progress *need* involve no assumption of numerical increase of population. Had the writer ever heard of virtue or knowledge?[1] That his main thesis in the passage is somewhat of a truism does not justify so gross a misconception in supporting it. The more we examine the more we shall find that it is indolence which makes us drop into the equation when our subject-matter demands the judgment.

I have finished the account of the equation before pro-

[1] Contrast Dante's lines:—

'Considerate la vostra semenza;
Fatti non foste a viver come bruti
Ma per seguir virtude e conoscenza.'

Inferno, xxvi. 118.

ceeding with the judgment proper chiefly with a view to coherence in treatment, and not with an intention of representing the former as inferior to or less ultimate than the latter, though in a sense which may appear from p. 91 above, such a representation might be held justifiable. But the conception of divergence, of a co-ordinate evolution generated by abstraction, seems more appropriate to the matter before us than that of linear development[1]. The equation is, as we saw, hardly even a momentary phase in the growth of genuine judgment; the two functions part company almost as soon as their significance reveals itself.

And quantity is more than one among many categories; as the simplest point of view which admits of difference and system it aspires to be, and in one sense is, *the sole* category, or ultimate ideal of knowledge. It may be treated as sole category falsely or truly. It may be sole in the sense that though abstract, yet, subject to the reservations involved in its abstractness, it has universal applicability. Every science, as we read in Aristotle, assumes its subject-matter, and does not give an account of it. The schematic world of space, time, and mass is in this sense, as an object of science, beyond question; it has only to serve as an abstract postulate in working with perceptible facts, and from this point of view is *a* truth, if not *the* truth about the universe as a whole. As enabling a coherent reflective view to be obtained of perceptible phenomena as a quasi-totality (always encumbered indeed by the infinite series), it is of immense scientific value and co-extensive with definite existence. For these reasons, again, the equation—the judgment of quantity—is rather co-ordinate with judgment than a phase in its development. And still more is there reason for so considering it if we take account of the false employment of quantity as sole category. This false employment arises, or would arise, supposing the category of quantity to be considered not merely as co-extensive with determinate existence, but as, in its abstrac-

[1] Above, p. 91.

tion, the ultimate reality of all determinate existence, and consequently as furnishing the final ideal of science. It is obvious that the true use of this as of every category slides easily into the false one. Every science is occupied with its own abstractions. Every individual mind tends to magnify that with which it is occupied. The category of quantity, for reasons mentioned above, lends itself to universal application. It seems a short step from universal application to sole application, but it is the step from truth to falsehood. It is not made exclusively by votaries of physical science, nor perhaps by them chiefly. It meets us in theology and in philosophy under the form of the quantitative infinite as a sublime attribute of the Deity, or of soul life, or of the universe as contrasted with the 'finite' mind of man. We find it again in barbaric or vulgar art, in as far as this relies for effect on mere magnitude, mere evidence of expended labour, or mere costliness of material. And we do also find it no doubt in a formulated shape wherever matter and motion are invested with the dignity of real existence in a sense and to a degree that degrades the individual and concrete realities of life into something secondary and fictitious. But it is plain that no such tendency is necessarily involved in the treatment of these abstractions as real characteristics of the perceptible world. There is no special virtue in non-atomic continuous extension, nor any especial iniquity in the resolution of material objects into systems of vortex-rings, if such resolution either is a good working hypothesis or represents a real fact. The only error is in taking either a hypothesis for a fact, or *a* fact for *the* sole fact—in confusion, not in mere abstraction.

The category of Quantity is, as we have seen, in its nature wholly relative. It is therefore incapable of furnishing an absolute and ultimate account of things. It not only cannot escape from the reference *ad infinitum* from term to term and condition to condition, but is forced to make this contradictory conception the very basis and

postulate of its scheme. We have seen that the moment characteristic quantity or proportion makes its appearance in the judgment, as in any quantitative judgment it may, the whole between parts of which the characteristic proportions obtain is tending to exhibit itself as an individual synthesis of true differences, not as a mere aggregate of indifferent parts. The pure quantitative judgment or mere equation [1] is possible only by abstraction from one aspect of the essential judgment-function. It is not easy to find a parallel to so comprehensive and systematic an employment of a single class of abstractions, except in any attempt which may have been made to regard the world as simply a congeries of qualities, say of pleasures and pains. No such system indeed exists—the point of view excludes system; but one may conjecture of some such state of feeling as forming the consciousness of children and childish adults who have no judgment to pass on things, persons, or events beyond the expression of their likes and dislikes.

Thus I have thought it desirable to treat as in some degree co-ordinate developments the two series of judgments which diverge from the simplest measurement or equation such as a colour-match. On the one side we have the full evolution of concrete thought, as it builds up the actual and individual world within the series of relativity; on the other side we have the truncated evolution which embodies relativity almost pure and simple, but, as the abstraction is never quite complete (for then it would annihilate itself), may in particular matter revive its relation to totality, as we see in the exhaustive judgment of enumeration, and in the quasi-generic judgments of geometrical classification. And in the same way the more concrete judgment may in particular phases and under particular stimuli borrow

[1] An equation that embodies a characteristic proportion is not purely quantitative. It involves in its interpretation the material differences between the parts which are in the assigned ratios, e. g. between angle and arc. See p. 186, above.

determinations from or generate approximations to the abstract series. This happens when the life of a nation is subjected to statistical treatment; when the disjunctive judgment is taken in the weakened form of enumerated alternatives, and so gives rise to the calculus of probabilities; or when any one of the grooves or threads of relativity which compose the perceptible world is taken as a problem *per se* and tracked to its consequences by means of a pure hypothetical judgment.

CHAPTER V.

Singular and Universal Judgment.

Singular Judgment.

1. THE transition from the singular to the universal judgment is the transition from the affirmation of particular fact to that of general fact. This transition may be expressed by distinguishing two forms of the singular judgment, which may be called respectively the Individual and the Corporate Judgment.

Individual Judgment.

i. In approaching the Individual Judgment we are returning from the one-sided offshoots of measurement to the normal and concrete evolution of the judgment. We saw in chap. iii that it is the judgment of proportion which first reveals individual quality; that is, quality which, although particular and characteristic, yet does not refuse to admit diversity into itself and itself to enter into various contexts. This quality, however, we found, if merely indicated as the content of an abstract idea, stood in antagonism to the demonstrative indication of present perception which alone could attach it to actual reality. We found ourselves entangled in such judgments as 'This oak-tree has a leaf-spiral of $\frac{2}{5}$,' 'This teasel has the bracts longer than the head,' 'This tower diminishes in width from story to story.' Such judgments as these must rank as singular, for it is of their essence to qualify present perception by the meaning of ideas; yet their content is really ambiguous, for, as we saw, the designative idea which ekes out the demonstrative reference to the concrete subject tends to grow into a condition and to make the judgment abstract, and in that sense universal.

Judgment with Proper Name.

a. The ambiguity which tends to split in two the imperfect singular judgment of the above type, which we have

ranked among the judgments of measurement, is apparently removed in the class of singular judgments which we now proceed to consider, and which are avowedly based on the fact of recognisable individuality. Such are judgments whose subjects are designated by Proper Names. Enough has been said in the Introduction of the essential nature of Proper Names. We have now only to consider the logical value of the judgments which are made by their means.

The determinate idea, present in the judgment of proportion, is omitted in the judgment made by means of a proper name. On the other hand, the demonstrative particle, which by itself is helpless, being only an indefinite reference to presentation, is replaced in the proper name by the indication, not to be effected without some kind of meaning, of a particular individual. Thus it might be said that the two elements of the subject in such a judgment as 'That young soldier is the victor of Actium' are fused together in the subject of 'Caius Julius Caesar Octavianus is the victor of Actium.' But the union is effected at the cost of a mutilation of the significance; although as in the present example the diminution of determinate content may be more than compensated by the accession of suggested ideas. Identification no doubt involves ideas, but with the proper name, as we saw, identification is the end and ideas are only the means. In unfamiliar matter, say in a chronicle of remote date, we might conceivably identify the unknown possessor of some name as figuring in several scenes or incidents without being sure what he, she or it might be; whether a man or a woman, or a favourite horse. In this sense the judgment that deals with a proper name is merely particular. It has no meaning that can carry its application beyond the unique individual to whom it is taken to refer.

But, though subject to this imperfection, yet Singular Judgments of the class now before us form a real advance on the Singular Judgment of Proportion. They rest upon the fact of characteristic individuality capable of change and persistence without sacrifice of identity. Instead of an

abstraction limited by pointing as if with the finger they refer us to a unique concrete thing in its continuous permanence. In this sense, because attached to a continuous element of reality not shut up within a particular time or a given perception, the Individual judgment is universal, and as we shall see leads up to a transition which takes us in one respect beyond the Singular Judgment. But universality —concrete universality—is not, we must understand, antagonistic to individuality. 'Caesar crossed the Rubicon' is an individual Judgment; yet in it we are not[1] confining the reference of Caesar to the moment in which he was engaged in fording the river. If we thus refused to refer the predicated content to the whole extended identity of Caesar the significance of the judgment would be destroyed, and an eristic error committed by reducing an assertion to a tautology. Where is the significance of crossing the Rubicon if we do not affirm it of the conqueror of Gaul, the rival of Pompey, and the true founder of the Roman monarchy? Thus the judgment regarding a person, place or other object that bears a proper name introduces a reference that is determinate without being abstract, and particular without being confined to present perception. It should be observed that not all classes of objects are suited to be distinguished by proper names. This fact is akin to the inapplicability of significant names indicating *a thing* to many objects endowed with material existence. The range of proper names falls within that of significant names of things, and the spheres of application of these two kinds of symbols compared with each other and with the sphere in which neither applies have a curious bearing on the subject of individuality (see above, p. 138).

Judgment with Name and Ideas.

β. With these Individual judgments must be classed all predications dealing with particular events, individuals, or objects, in which the demonstrative particle is dispensed with and replaced by a symbol referring to the individual. It will be found that these particular events, persons or

[1] Contrast Lotze, Logik, sect. 58.

objects have ultimately to be designated by reference to a proper name, or to some symbol which nearly approaches the nature of a proper name. As such e.g. may be ranked all chronological indications—'Christmas Day, 1885 A.D.'

It is obvious that such a symbol, or a proper name, as a fixed point in history, may be supplemented by any amount of definitely significant ideas; and as the proper name or the date is often understood or presupposed, e.g. in a continuous narrative, we are apt greatly to under-estimate the part played in judgment by the content of such symbols. Page after page of discussion about political or social tendencies may chance to be found in a reflective history, say in Lanfrey's History of Napoleon, without the mention of a proper name. But in so far as these discussions are to be taken as significant of the actual conditions of an actual epoch, they are understood as ideal content predicated of the nation, age and persons with whom the narrative is concerned. Chronological symbols exhibit the transition from the demonstrative to the proper name in a peculiarly clear light. 'To-day,' 'yesterday,' 'last year,' are just on the line between demonstratives and proper names. 'To-day' seems naturally to = 'This day,' a demonstrative indicating mere relation to the percipient subject[1]. 'Last year,' 'twenty years ago,' show the relation to the percipient subject growing into an objective system. And when we come to the employment of an era, A.U.C., B.C., A.D., we have the system transferred from the accidental percipient subject, and attached to the content of a proper name. Wherever we have 'I' or 'my' etc. as points of reference in narration, we are dealing with something between a demonstrative and a proper name. And every narrative judgment which goes beyond a mere impersonal or demonstrative reference to present reality or to my own perception may

[1] I take what I believe to be the actual meaning in use. Philology may or may not support it as the original meaning. We are bound to take philology into account as evidence of evolution and as a guide to observation; but it cannot override present usage.

prima facie be said to involve a reference to some proper name. No *mere* abstract idea can form the subject of historical predication. How far this *prima facie* conception must be corrected by allowing for judgments which may be capable of uniting without mutilation the powers of unique reference and of determinate notions is a question which will occupy us in the sequel.

Corporate Judgment.

ii. Closely allied to the Individual Judgment, and perhaps in rigid technicality not distinguishable from it, is what for want of a better name I call the corporate judgment. This title is meant to include all such affirmations as deal with comprehensive totalities or aggregates which we *bona fide* take in their corporate or singular aspect, and do not consider either as in the collective judgment, in the light of sums of enumerated particulars, or as in the hypothetical judgment, in the light of mere abstractions whose very existence is not absolutely postulated. Such a judgment may be expressed indifferently by a singular or by a plural enunciation, so long as the name used in the plural is a *bona fide* designation of a known or knowable unity in respect of its characteristic features: e. g. 'The ancient Greeks were at once a most scientifically and a most imaginatively minded race.' This judgment obviously = 'The Greek race was,' etc. This is not a collective judgment in the sense which has above been given to that title. It is not capable of being obtained by successive synthesis of the component units—by enumeration—and retains therefore no special extensional reference to the individuals who as an aggregate constituted the ancient Greek race; it starts from the idea of a common stock as a historical entity with peculiar endowments and with its own rise, decline and fall. Other instances are such as 'Europe has acted harshly to the modern Greek nation.' Europe is here not a geographical expression, nor even a mere body of nameable states; it is an organisation acting upon definite resolutions and through a known combination and proportion of forces. Several states in geographical Europe probably do not count in

political or concerted Europe. Again, we may say 'The House of Commons detests a bore.' This might be transformed into 'All members of the House of Commons' etc., but the two affirmations are only equivalent if the latter is understood of the members *qua* members, i. e. as engaged in debate in the House; otherwise this latter becomes a mere collective judgment, dealing with the members as a collection of individuals who share two attributes, viz. belonging to the House of Commons and hating bores, but wholly neglecting any reference to the House in itself as a single body with its own functions and peculiarities, among which is the one predicated in the judgment. The glacial period, The French Revolution, The Italian renaissance, The solar system, are 'corporate' realities and subjects of singular judgments of the species of which I am now speaking.

The distinction between such individualities and those of really single objects or persons such as form the subjects of individual judgments is not a matter of principle, for in both the existence of the subject is affirmed, or, as I prefer to say, absolutely postulated. Nevertheless, the fact that such individualities as we have now before us do on one side consist of immense aggregates of particulars, and are therefore capable of being regarded at any moment from points of view antagonistic to that of their individuality, either as abstract ideas or again as series of numerable units, makes it desirable to mark by a specific distinction the fact that *in their unity* they can be regarded as individuals.

On the other hand, the subjects in question are again not easy to distinguish absolutely from the content of scientific class conceptions whose individual unity and actuality are disputable. The line which I have drawn is intended to correspond with the distinction between history on the one hand and truly physical science on the other. History deals on the whole with contents into the essence of which time enters, and which therefore, however comprehensive,

are ultimately particular within the phenomenal series. Abstract science as a rule deals with timeless connections and systems of attributes, though it will be necessary in exhibiting this tendency to make allowances for a considerable admixture of and recurrence to the historical attitude, for in the light of evolution, time, or at least amount of change, enters into the essence of most things. And besides Abstract Science we must not leave out of account Classificatory Science on the one hand and Philosophy on the other, both of which, though in different senses, may claim to deal with actual realities.

The Corporate Judgment marks the fullest development of the affirmation of particular fact, and at the same time a near approach to the affirmation of general fact. In other words, the affirmation with which we have so far been dealing is beyond possibility of dispute Categorical affirmation, treating of contents which the judgments affirm, or at least absolutely postulate to be features that have or have had actuality in the world continuous with present perception. But from this point onwards the Categorical character of judgments becomes a matter of theory and of analysis. There is indeed, according to the scheme here adopted, no absolute separation between the Singular and the Universal Judgment. Still the distinction, unknown to Formal Logic, which is the ground of that separation as made by recent writers, is the basis of our scheme also. The Historical or Singular Judgment, and *a fortiori* the perceptive or imperfect singular judgments that precede it in our scheme, are not on all fours with the judgments of science, whether classificatory or analytical, or of philosophy. Before attempting to trace in these latter types of judgment the elements which we have observed in the former, though in other proportions and combinations, it will be well to examine more particularly the one leading difference between the two chief stages of affirmation.

Time and existence in Singular Judgment.

iii. The Judgment that asserts particular fact coincides with the Categorical Judgment in the primary sense of

the latter title. According to the standpoint which for the present we have adopted, a judgment is Categorical when it asserts some thing or event to belong to the actual world in which we live. This assertion is made both by the Individual and by the Corporate Judgment. For the subject in these judgments is something that can exist as a particular reality, and is therefore taken or presupposed to be a real particular, while at the same time its reality is so far determinate that it can intelligibly be denied, which we saw not to be the case with the 'this,' 'here,' or 'now' of the Imperfect Singular Judgment. In these judgments, therefore, though not necessarily in them alone, we have existential assertion. And the simplest test of the presence of such an assertion is to ask whether the non-existence in reality of the content which enters into the judgment renders that judgment false. To such a question the primary answer is that *at least* in all judgments where time enters into the content — i. e. which assert facts in time — the non-existence of this content renders the judgment false. And these judgments will be found to be coextensive with the Historical Judgment, affirming as it does not necessary connection, but particular reality within the phenomenal series. And thus, as said above, the Historical or Singular Judgment is equivalent to the Categorical Judgment in the sense here under consideration.

This answer, however, demands explanation and limitation. If non-existence of the content or subject of a judgment renders the judgment false, we have further to ask, Non-existence *when*?

In every judgment we must distinguish between the time *of* predication and the time *in* predication. The time *of* predication, i. e. the time at which some thinking being makes the judgment, is relatively to the content of the judgment a mere accident, and alters actually while we are occupied in judging, and *a fortiori* when the judgment is rethought after a lapse of days or years. The time *in* predication is the relation of the predicated content to the

total content of the temporal series of events which we construct and contemplate as objective. The time *in* predication, if any, is affirmed as an attribute by the judgment; the time *of* predication is not affirmed as an attribute by the judgment, which therefore is not made false by any relations whether negative or positive between its content and that time. Hence it follows that the non-existence of the individual subject or content which falsifies a Singular Judgment is non-existence at the time *in* the predication, not non-existence at the time *of* the predication. 'Thucydides is among the greatest historians of the world' is not false, although Thucydides is in fact, when we speak, not a living man [1]. 'The House of Commons is an integral part of the British Constitution' does not depend for its truth on Parliament not being in dissolution at the moment of predication, but only on the co-existence of a House of Commons with the British Constitution in the sense and to the extent demanded by the import of the judgment. It appears to be a corollary from this principle that if no time in particular is involved in the import of the judgment, which is the case at any rate with geometrical truth, it becomes all but impossible to convict a judgment of falsity on the score of non-existence of its content; although the demonstration of utter non-existence, i. e. I suppose of impossibility, would so convict it. This bears on the categorical character of the generic and hypothetical judgment.

A subtlety is introduced into the problem by the phenomena of *tense* which include the time *of* predication, or a relation to that time or personal era, within the content of the judgment, and so within the allegation of time *in* the predication. The content so superadded is of the most

[1] It may be objected that it is false to say 'Thucydides *is* a general in the Peloponnesian war,' simply because Thucydides does not exist at the time of predication. Where we have true tense this is so; we have then not got rid of the personal era. See p. 211. It must be remembered that in 'Thucydides *was*' etc. Thucydides *is* non-existent, and yet the judgment is true.

fugitive and relative nature, and is constantly neglected even by historical narrative. Picturesque history neglects it by the use of the historical present, and philosophical history by the use of the logical present. Nevertheless where a past, future, or true present tense (neither historical nor logical) is intentionally employed, its relation to the personal era or date at which the narrative is drawn up beyond a doubt enters into the judgment and makes an assertion which demands a particular limited existence on the part of certain objects and events, and is false if this existence is not as affirmed. In the case of the present tense there is a peculiar subtlety arising from the confusion between the atomic or nearly atomic and the continuous or ultimately non-temporal present. The former is the import of the present as a true tense; the latter of the present as it approaches to a mere vehicle of affirmation. Compare the following examples: 'The Derby is being run at this very moment;' 'The horses are leaving the paddock for the Derby of 1861' (from a narrative written in 1883); 'The Derby is run once a year;' 'The Derby race in England is an instance of those customs which owe nothing to government but yet amount to national institutions.' The first of these judgments if true now must be false after the lapse of five minutes. The second is only false if there was no paddock or no Derby in 1861. The third is only false if at the time *of* its predication the race has altogether ceased to be an annual event; but its present is well able to comprehend within itself the intervals of time which the import of the judgments admits and requires, and is not falsified by reason of the non-existence of the race during these annual intervals. And the fourth is false only if there never was nor will be such a thing as a Derby race having the importance alleged in English life. I am discussing of course only how far the respective judgments become false if we assume non-existence of the content; I am not raising the question of the material truth of the attributes enunciated. It is only in the first of these four examples that we see the

present operative as a true tense. In the case of the past and future the difficulty of tense does not arise in its full extent; the tenses which indicate them must of course introduce the personal era, but for that very reason cannot be confused with a mere form of predication, for which they have not the appropriateness that the present possesses. Therefore they do not risk the reduction of every possible judgment to a statement about a momentary date or epoch, which would be the result of neglecting the above distinctions in the use of the present tense. And moreover, these very tenses 'was' and 'will be' prove that it is at least not necessary to the truth of a judgment that its content should exist in the moment *of* predication. It is however necessary for judgments dealing with past and future that their content should have the alleged *relation*, however fugitive and accidental, *to* the time of predication. But at any rate in none of these cases, neither in present, past nor future, need the content be shut up *within* the time of predication or the time related to that personal era. Past and future do not pretend to be momentary, and the present cannot possibly succeed in being so. It must be credited either with duration in itself or with a continuity that shades by degrees into the past and future.

Thus, though the time of predication has the slightest possible relation to the content of judgments, yet no doubt, when predicated as an attribute by help of true tense, a relation to the time of predication or subjective era enters into predication. And in so far as history as a whole falls in the past, the use of the past tense in narrative bears true witness to the essential particularity and limitation of the existences with which history deals. But after all, the past is not a point but a line; and so for precise temporal import even of narrative propositions in the past tense we must go, not to the tense, but to the import of the judgment. And *a fortiori* this is the case with the present, where the true tense is difficult to distinguish from the same tense used as the mere form of predication.

We have thus seen in what sense and to what extent Singular and Perceptive Judgments are identifiable with Categorical affirmation. The Judgment whose content involves a limitation of time is plainly false if in the time-relation prescribed by such a limitation its content is non-existent. This test shows that all such Judgments are assertions of particular fact. Even the example (on p. 217) which goes beyond common historical usage nevertheless asserts fact which is essentially in time, although the truth of the assertion is not relative to the date of predication. If the Derby race never existed the judgment would be false, and *its* existence involves a multitude of temporal relations which are necessary to its being what it is. It is essentially a fact in time.

When we get away from the proper name and the relations of events in the temporal series, we find it much less easy to say what non-existence of particulars, if any, would imply the falsity of the judgment, and in what sense therefore, if in any, the judgment alleges actual fact belonging to the real world. We must bear in mind that we have up to this point been dealing with unanalysed perceptions and with proper names and their expansions. We have therefore not got rid of the element of irrational concreteness which attends all judgment whose subject is given as if by simple pointing with the finger; for *qua* a mere symbol of identification the proper name itself partakes of the character of simple pointing; and until we reached the proper name we were encumbered with the demonstrative particle.

Therefore the judgments thus far considered, omitting the one-sided forms that arise out of measurement, possess certain peculiarities. They assert, to begin with, the existence of things or events in time. In doing so, they restrict and burden with irrelevant matter the application of determinate ideas, which, as the only symbols of meanings, they cannot avoid employing. Taken therefore as rational connections of attributes, a point of view which

determinate ideas challenge, and towards which, as we saw, the import even of proper names tends to develope, the judgments which we have been considering are *false*, being burdened with irrelevant and deficient in relevant matter. This is the same thing as to say that they present an aspect of necessity, in which aspect they are defective and so false.

The Universal Judgment.

2. By the title of 'Universal Judgments' I mean to designate, in all their phases of import, the assertions usually typified by such well-worn examples as 'All men are mortal,' 'All fire burns,' and 'All triangles have their three angles equal to two right angles.' It has been shown above that perceptive and singular judgments, and more especially those which employ proper names, possess an element of universality as predicating identities into which differences enter or which persist through differences. But in spite of this fundamental unity of the judging function, the distinction between the 'Singular' and the 'Universal' Judgment has an importance for us which it has not for traditional Logic; which indeed treats the Singular and the Universal Judgment as on the same level in a strictly logical point of view, and both, consequently, together with the particular judgment, as species of Categorical enunciation. The attitude which we have to adopt towards this arrangement was defined in an early part of the present book[1], where we saw that it was impossible for us to retain these species of enunciation in their traditional relations. It is beyond a doubt that the Universal assertion must at some point of its development assume in some aspect or in some degree a hypothetical character; while if the genus Categorical, which certainly includes the singular judgment, extends into or over the domain of the Universal, it can only do so subject to reservations which are unnecessary so long as it is confined to the judgments of present perception or of simple narrative.

[1] See *supra*, chap. i. p. 93 ff.

The Universal judgment, then, is not distinguished from the Singular judgment by the mere feature of Universality, but by a special phase of Universality, that is to say, by the predication of a *universal law of connection*. It has, indeed, been obvious to us throughout the analysis of judgment that universal connection was everywhere at work in the background, exploiting any qualification expressed or implied in the Subject, for the benefit of systematic connection or necessity, and at the expense of the simple perceptive or narrative conjunction of contents; until, surrendering for the moment the task of intelligible qualification of reality, we fell back, in the proper name, on an attempt at unique designation [1]. But here again we fail to escape from universal connection or necessity, and in the names of illustrious individuals, as in those of nations, epochs, or movements, we have found that every significance tends to break down the mere conjunction of *data*, and to exhibit itself as a connection of reason and consequent. We attempted to draw the line at events and individuals into whose content time entered, and to show that judgments dealing with such matters as these were inevitably allegations of fact, and not of abstract connection. Now we adhere to this distinction, and it is perfectly true that any fact which is especially involved in one portion, however extended, of the temporal series of phenomena, must have existence within that portion if an affirmative judgment about it is to be true. The assertion of such a fact in its accidental concreteness is therefore radically different from the assertion of a mere law or relation, and if taken in this latter sense would necessarily be false. But we found in the corporate judgment that it was not perfectly easy to distinguish the facts of history from the truths of science; for sets of events

[1] I have said above (Introduction) that I do not give this as a historical account of the genesis of proper names, which must no doubt have been applied and recognised by a gradual differentiation. But none the less, wherever language has fixed them as a class of words, they perform the function and are subject to the modifications indicated in the text.

greatly extended in time appear to pass by a sort of *sorites* into sets of events which, though in respect of existence precisely on all fours with actualities limited in time, are nevertheless either not treated as relative to time or really are not held to be so relative. In order, while marking the distinction demanded by the absence of limited particularity, to give full weight to the continuity of import between these types of judgment, I shall not follow Lotze and other modern writers in identifying the universal *ab initio* with the hypothetical judgment. I shall prefer to distinguish within it two species, of which the first, the *generic* judgment, alone belongs to the main evolution of thought, and the second, the *pure hypothetical*, is regarded as an abstraction of a quasi-mechanical character, and consequently as a divergence in the direction of the arithmetical and geometrical judgment.

The Generic Judgment.

i. The generic judgment is the qualification of reality under the aspect of a Natural Kind by attributes or relations incident to that Kind. A Natural Kind is for our purpose a Kind accepted and treated as such by any science. We have already seen that the geometrical sciences are in this respect in a peculiar position, and we have discussed the limits under which their quasi-generic judgments may be taken to embody truth about actual reality. The question of alternative classification, which arises on account of the different points of view introduced by different sciences, was treated in the Introduction, and should cause us no difficulty *if* we are once able to understand the nature of the truth embodied in *any* science. For every science employs some abstraction and idealisation, though there is an all-important difference of degree between contents which are merely abstract as not sensuous, and contents which are abstract as not concrete.

The restriction 'incident to that kind' is not intended to exclude relations which one kind shares with other cognate kinds. A purist logic, following a suggestion to be found in Aristotle, might indeed require that every generic judg-

ment should be 'commensurate' or characteristic. It would then have to deny that the possession of breathing apparatus was incident to man, because he shares the respiratory function with the whole organic world. Such a view would be illustrated by the fact which was commented on above, that e. g. the animal properties of man are, in man, modified by their relation to his humanity; so that in order to represent them as features of *man* they ought ideally to have certain modifications assigned to them, while in their abstraction they can only be set down as characters correlative to the no less abstract idea of animality as such. But this principle seems needlessly purist. The attributes which man shares with the animal world are elements of identity, however partial, between him and it; and there can be no reason against characterising him by these identities which would not tell equally against any knowledge which falls short of perfection. The rule to be borne in mind about such cases is that imperfect knowledge only becomes *false* when mistaken for perfect knowledge. In as far therefore as the form of the judgment implies a truth completely adequate to its subject, something may be said for the view which has just been stated. But we shall find if we press the matter home that this ideal is to be regarded as the vital principle active in knowledge, but not as hostile to any genuine fact that is free from confusion.

Under 'incident to the kind' then are included the attributes and relations which lie at the root of the individuals' being, although shared by them with individuals of other kinds, or even with mechanical or geometrical wholes. It is only to be borne in mind that such relations, e.g. the characters of vertebrate organisms, are not thought as mere abstract properties, when applied to specific kinds, but are regarded as concrete schemes presenting both a general and a specific aspect. It is in this characteristic of graduated identity that the intelligible order of the world reveals itself to us.

The generic judgment has always been the battle-field

of conflicting logical tendencies, corresponding to actual needs and features exhibited in various points of view by the judging activity. I shall endeavour, on the same plan which I have hitherto pursued, in some measure to satisfy these tendencies by distinguishing as different, in phase and line of evolution, intellectual acts which are often reckoned as one and the same. But it follows from the nature of thought that all such aspects have a real connection, and are in fact rather distinguishable than separable. Thus in distinguishing the generic judgment from other acts of thought we shall also be analysing this many-sided judgment itself and justifying to some extent the views of those who have recognised in it only one or other of its many sides.

The Quasi-collective Judgment.

a. The Generic Judgment—the Universal Judgment of common life and of classificatory science—was regarded by Aristotle, as is well known, under two connected aspects, as a judgment of Allness and as a judgment of Necessity. The former of these aspects has been seized on by formal logic, and the doctrine of logical universality has been adapted mainly to the consideration of subject and predicate as names or ideas applicable to groups of individuals. We examined the judgment from this point of view, as dealing with an aggregate arising out of enumeration, in a former chapter. We there saw its actual goal in the Collective Judgment and its reversion towards a more concrete and natural mode of thought in the Exhaustive Judgment, which amounts to nothing but a Generic Judgment very strictly taken in extension. It must however be remembered that we did not think it possible for any judgment, however closely confined to an aggregate resulting from enumeration, to avoid designating the individuals by a common attribute, and predicating an attribute of them. Attributes are enunciated by extensional no less than by intensional judgments; but in the latter they are connected with attributes, in the former they are centred in the identity of individuals. Therefore

it is possible to consider the Generic Judgment as differing from the Collective Judgment simply in degree, viz. by predicating attributes of an unknown or unlimited and not of a known or determinate aggregate, the actual means of predication being in both cases alike a general attribute, though in the latter case attached to reality by a proper name or its equivalent. But an unknown or unlimited aggregate of individuals is a contradiction[1], a numerical problem which proclaims itself insoluble by enumeration, and therefore the judgment which is couched in this shape, and which in fact conveys a perfectly intelligible meaning, must derive this meaning from some other source than from such an enumeration as that on which the collective judgment rests. The Exhaustive judgment must be interpreted by the Generic and not by the Collective.

Examples of the Quasi-collective judgment of which we are speaking are—'All men are mortal,' 'All organisms both breathe and assimilate,' 'All unstriped muscle in the human body is inaccessible to the control of the will.' This last example, however, is suggestive. The Exhaustive judgment, i.e. the Generic judgment in its aspect of 'allness,' is helpless in the face of the most trivial exception. Thus '*Nearly* all striped muscle is under the control of the will,' but the muscles of the heart form an exceptional case, and, though striped, are normally inaccessible to volition. Nevertheless there can hardly be a doubt that the coincidence expressed by the judgment must indicate some sort of connection, however circuitous, between the appearance of the muscle and the degree in which it is under control, and that the exceptional case must be accounted for by special conditions. But on its purely enumerative side the judgment has nothing to say to this; it only knows that the sum-total of Enumerative judgments cannot be made, and the judgment of allness is therefore unwarranted. It is obvious that the affirmation of universal connection which in such an instance we feel to be all but warranted

[1] See p. 175, supra.

is not approached from the side of the individual units, but from the side of the common or continuous nature which binds them into a whole.

True Generic Judgment.

β. As dealing with a common or continuous nature the Generic judgment may be more properly expressed in the form, 'Man is mortal,' 'Water boils, under one atmosphere, at 212° Fahrenheit,' 'A society organised on a purely commercial basis treats the working classes as little better than slaves.' These propositions are accepted as practically equivalent to 'All men are' &c., 'All water' &c., 'All societies' &c. Here however it is plainly the connection of attributes that warrants the affirmation concerning individuals and not *vice versa*. When thus regarded, the Generic judgment challenges comparison with the Singular judgment in both its forms, both as Individual and as Corporate.

Ordinary Generic, or Analogical Judgment.

a. 'Man is an animal capable of social life,' 'The bacillus is a septic organism,' 'Throughout the vast Orchidean order, including 433 genera and probably about 6000 species, the act of fertilisation is almost invariably left to insects.' These are affirmations that unquestionably refer to something real, but yet employ neither perception nor a demonstrative nor a proper name. Therefore, *prima facie*, it seems as if the determinate idea had come to its rights, and were no longer obscured by any irrelevant elements of the phenomenal concrete. The act of thought ought, it would appear, to fall at once into the groove of abstract necessity: '*If* man, then social;' '*If* Orchid, *then* insect-fertilised.' But ideas such as those now before us offer a resistance to such treatment. The determinate idea is abstract, indeed, as all thought is abstract, but nevertheless it may have a content which is concrete, and in the example before us we have such concrete contents. These, therefore, bear the morphological character of individuality, by which alone even the unique object named by a proper name is made recognisable, persistent, and so universal. Compared with such an individual subject the Generic subject has lost unique

reference; but it has gained abstract significance, with which the proper name was incompatible. And it is in virtue of this significance, the significance of individual self-completeness, that the Generic subject persists as an identity through the differences which form its attributes. Now the individuality when reduced to a content is not single, but exists in instances. Thus, in attaching differences to the individually characteristic content as such the judgment goes altogether beyond the synthesis of differences in an actual individual subject, and affirms such a synthesis mediately of a number of subjects, which may be taken as endless seeing that its limit is at this stage not held essential and not enquired after. Such a judgment, which treats a concrete individuality as an abstract universal, and extends its incidents to all individual instances, may be described as an *analogical judgment*. And this is the fundamental nature of the ordinary Generic assertion.

The introduction of the term analogy into the theory of judgment may indeed be objected to on the ground that analogy is a kind of inference. But the fact is, that apart from any *general* question of a connection between judgment and inference, we are now at any rate on the threshold of an activity of judgment in which inference is unmistakably present. All that we can do in order to avoid a premature discussion of inference is to approach the analogical judgment rather as a conclusion the content of which is open to analysis than as a complete inference whose process lies before us. It may be added, that logic is quite familiar with the idea of 'necessary' judgments. Yet necessity involves inference far more explicitly than does analogy.

In the analogical or *ordinary generic* judgment, then, we have neither implied reference to perception as in the impersonal judgment-form, nor the demonstrative 'this' or 'that,' 'here' or 'there,' nor a conventional implication of unique reality by means of a proper name. The subject—I speak of the immediate subject or subject within the judgment—is an idea, and *qua* idea, is abstract. But we must

distinguish between abstractness as incident to thought in contrast with sense-perception, and abstractness as a character attaching to contents present in thought. In the former way of speaking all thought is abstract. In the latter, some is abstract and some is not. The ideas which form the subject of the generic judgment in the phase now before us are not abstract in the latter sense. They are ideas of totalities, existences complete in themselves, to which we cannot indeed venture to apply the conceptions of teleology proper except in so far as the wholes in question are products due to the human mind, but which must be regarded from the standpoint of that secondary finality which may be described as morphological unity or quasi-teleology. We have thus a character or complex of attributes which is at once general and individual, abstract in thought and concrete in content. As abstract, it defies enumeration of instances, and implies necessary sequence or connection of attributes. As individual and concrete, on the other hand, it refuses to be taken as a mere ideal antecedent in a relation of necessity, i. e. of reason and consequent. The conciliation demanded by these antagonistic elements of import is found in the judgment of analogy. The essence of this judgment is that it is neither purely subsumptive, as expressing a *de facto conjunction* of attributes in a single subject, nor purely constructive as expressing a *de jure connection* of attributes independent of the immediate subject in which they may exist, but is something intermediate, as expressing a perception or presumption that the content enunciated in the judgment is bound up with the characteristic individuality which forms the immediate subject.

The ultimate foundation of any such insight must be the final cause or teleological idea of the individual, which however, when considered as an immanent or embodied final cause, is most prudently treated on the level of morphological character. We may indeed safely say that the purpose or final cause for which we make a microscopic lens is to combine magnifying power with light and defini-

tion, and from this purpose, by help of a number of further judgments dealing with optical and mechanical truths, the physical attributes of a good lens may be constructed. But in dealing with things not made for a known purpose we cannot apply any such abstract rule, and must fall back on the idea that the thing discharges an *actual function*, or at least *looks as if it had a function*, which must be taken as immanent and identified with the thing in its concreteness. The judgment that pronounces what is involved in this content and what is not rests on the presumption of the individual unity of the content, and on the capacity of discerning from the structure of this unity aided by empirical knowledge of instances what is essential to it and in what degree. The insight in question has undoubtedly some kinship to aesthetic judgment, for both depend on the power of seizing the concretely presented import or principle of unity of a concrete whole. To judge the structure of a fossil creature from a vertebra, or to detect the affinity between two zoological species which are externally much modified, is a synthetic apprehension of the same nature as that which realises the construction of a picture or of a drama. Such judgment, however, is merely the condition precedent, and not the essence, of the true relation between the mind and fine art.

The analogical judgment, like the aesthetic judgment, is essentially outside relativity and necessity, and incapable of being resolved into them. It is true that judgments of abstract relation, drawn from the mechanical or geometrical sciences, are perpetually coming in aid of analogical truth, by indicating that this or that *de facto* service within the concrete individual *can* only be performed by its parts under this or that condition. To support a certain weight the plant stem or spinal column must have adequate strength. To impel a certain bulk and mass through the air at a certain velocity the bird's wings must have a certain area and striking rate, the arrangements necessary to which of course react on the whole muscular circulatory and

respiratory apparatus. But even this merely rhetorical selection of an abstract final cause is really unjustifiable. Which comes first? why such a weight on the stem? why should the bird's body have such a bulk or mass? There is nothing to fix any one of these elements as a given final cause to which the others must be adapted. Adaptation to the bird's prey or the like is again simply *de facto*. An animal might have to change its prey by reason of a change in their relative powers, just as probably as it might develope new powers to keep pace with those of its prey. And further, in the background we may see such a law as that of the Conservation of Energy dominating the entire system and operations of everything that moves. In all these relations we observe the ultimate character of necessity, viz. the reference of a subject to a whole other than itself; e. g. the treatment of an animal as a part in the whole of moving matter, or as a figure having properties in space, so that in each of these relations it appears as determined by the character of a totality other than its concrete self. The nature of space for instance is *per se* a *datum* or fact; but when it determines the results entailed, e. g. by the shape of a leaf, it is exhibited as a whole prescribing the relation of its parts, which relation as regarding something that is not merely a part in space is external but constraining and so necessary.

Yet even if the entire construction of an individual content were laid before us in terms of mechanical analysis, still the analogical judgment would force itself upon us, as the aesthetic judgment would in a parallel case. Analogy would then indeed no longer be the chief instrument in discovery, or at least in presumption of universal connections, because these would be capable of constructive apprehension of a more direct and relevant kind. Such a state of knowledge may already in some degree be illustrated by the Darwinian analysis, say, of an orchid-blossom, in as far as it succeeds in tracing the mechanical modifications, which, each of them representing a definite physical adap-

tation to some external circumstance, have generated the present structure of the flower. The same observation might even be applied to the identification of types and their affinities. The mechanical history of any organic structure would, if ideally complete, include the nature, degree and physical causes of its deviation from kindred structures.

But all this would not interfere with the import of the generic or analogical judgment. For this import consists in the identification of individuals with a concrete content, and such an identification involves connections which differ in kind from the identification of abstract relations which are not Things. They take the content not in its external relativity, but in its relation to self or to an immanent final cause—a final cause identical with itself. We have examined this self-relation in the more difficult case of geometrical figures which are absolutely and adequately reducible to examples of general conditions, and seem merely to mimic the self-contained relation of the concrete thing. This relation is an element of import which does not wholly disappear even in those kinds of existence which are hardly ranked by common language in the category of individual things—as we saw to be the case e.g. with the elements, and in short with all unorganised substances. I do not restrict the meaning of the term unorganised to = 'inorganic' in the technical sense; but I employ it to designate any portion of matter, organic or inorganic, which is not shaped into a whole by human activity, or regarded in respect of its natural subordination of parts with interest due to its unity for our intelligence. Every element has no doubt its peculiar minute structure, and every fragment or portion of matter has no doubt its spatial or other relations which unite it into a whole. A pebble or a bit of rhomboidal spar or a nugget of gold has a self-relation, a characteristic peculiarity which makes it single, and distinguishes it as a persistent universal from things external to it. Much more has any organism a typical individuality which introduces the distinction of inner and

outer, essential and relative, into what as a mere example of general laws has no self-relation [1] and no inner or outer.

And in these last two sentences I have omitted the strongest case, because it is so strong as to dispense with the reservation which we were trying to illustrate. But when we come to reflect on the conception of a *thing*, we must be struck with the fact that by far the greater amount of what we most readily recognise under that title are objects made by man for purposes which he consciously embodies in their structure. I cannot think that, apart from our familiarity with such objects, the conception of a thing would seem so simple as it does. A mountain, a waterfall, a wave of the sea, are *things* chiefly to the æsthetic perception; and if we left this perception out of account, it would not be easy to assign the boundaries of their individuality, or to single out its essence. Complaint has been made [2] that those who lay stress on the progressive interpretation of the idea in nature do not find room in their theories for the achievements of the screw and the lever, *and* for the laws of the equilibrium of fluids, of pressure, and of tension. These examples may be regarded in two aspects. The screw and the lever are best known to us as *tools*, in which capacity they belong to the sphere of *mind*, as objects endowed by human foresight with an immanent significance depending on their adaptation to a determinate purpose. But as mere characteristics of matter mechanically considered they rank with any of its general attributes,—rigidity, gravity, inertia,—attributes which are the basis of all material organisation, but do not by themselves suffice to give individual interest to any fragment in which they are embodied; and among such attributes must be ranked equilibrium of fluids, and the effects of tension or of pressure.

[1] Of course such a point of view is unreal in its abstraction. If the thing were absolutely regarded without self-relation, its external relation would be gone too, for what would there be to determine it? The point is that the centre of interest, in relativity, falls outside the self.

[2] Lotze, Mikrokosmus, English Translation, vol. i. p. 17.

But what are we to say of the shell that screws itself into the sand, of the screw propulsion exerted by the porpoise's tail, or of the levers which form the limbs of animals? We dare only speak, in relation to such phenomena, of a *de facto* purpose or actual function. In virtue of this function, this contribution to an obvious and real end, the total life and motion of the animal in which they are found, we claim for these arrangements a morphological unity which forces us to grant them the character of elements in things that have concrete individuality. We dare not ascribe to them the unity of an ideal purpose, as we safely may to the screw of a micrometer or to the lever of a balance; but we treat them as elements in a unity *analogous to* that with which we are familiar in objects that represent the purposes of our mind. The rudest mechanical contrivance is in this respect on a level with the products of fine art and superior to those of nature, that it unites the abstractness of thought with the concreteness of sensuous existence; i.e. while in one aspect a mere material object, yet in another it embodies an idea, and does so determinately and without irrelevancy.

Thus the conception of machinery has a double and not a single import for logic. If on the one hand it accents the fact that matter is indifferent to our purposes and simply acts and reacts according to its own nature—and it is this of which we are constantly being reminded as the mechanical or uniform aspect of the world—yet on the other hand it is the most obvious example of a concrete embodiment of mind in matter, and corroborates if it does not awaken the reflections of the understanding on the rationality of things. Of this rationality the existence of individual types as concrete universals recognisable by the analogical judgment is a higher phase, a phase more akin to individual intelligence, than matter in its abstract and general modes. And therefore the generic judgment resting on analogy, i.e. on the perception of concrete identity of content, is not capable of being superseded by the ab-

stract judgment of pure relativity. The latter, if ideally complete, gives a true account of what occurs in terms of mass and motion, but necessarily omits the teleological or quasi-teleological import which gives the content of the judgment its interest and significance for knowledge.

I will analyse a single example. Exogenous trees display 'annual rings' in the wood, which are due to the augmented pressure of the bark as each year's new wood expands the stem, resulting in the flatter formation of the outer and later cells in every year[1]. As this stands I call it a generic or analogical judgment. It is indeed based on one of the above-mentioned simple mechanical relations, the effect of pressure; but it predicates this relation within a concrete individuality which gives it an import that as a mere mechanical problem it would not possess. Let us reduce its essential points, however roughly, into the latter shape. We shall obtain some such residuum as this: 'A fabric gradually constructed under increasing pressure out of a material which hardens after a time will show increasing effects of pressure in its later-formed portion.' Here we have, in part at least, 'freed the direction,' to borrow an expressive phrase from Bacon, i.e. stripped off circumstances which are irrelevant to the production of the effect in question. But with these irrelevancies we have lost in the case before us not merely confused concomitants of perception, but the interest which gave the example its place in knowledge. The fabric is no longer wood, the gradation no longer that displayed in the annual rings of timber, the subject of the judgment is no longer reality embodied in the characteristic individuality of the exogenous trees. The import of the judgment is gone. 'But its content is subsumed under the simple mechanical relation, if this is rightly understood.' Perhaps; but what does this mean? If the import of the concrete thought is to be saved, it must mean

[1] Probably other causes concur in this process. I have purposely simplified it. The rings are annual only if the period of growth in the year is single. A second hot season may cause a second ring.

that the analogical judgment is re-thought in its full depth, but with the explicit knowledge that it includes the abstract mechanical relation. The typical character of exogenous trees, though we must not call it a final cause, yet prescribes the extension and gives a definite reference to the content of the judgment. And I must here put the reader in mind, that, wishing to gain nothing from what may be called accidental ignorance, I have laid no stress on the present impossibility of constructing any living thing on purely mechanical principles. Individuality rests on a difference, not on a confusion, of categories. I am convinced that no organic nor spiritual movement accessible to human intelligence is without a mechanical aspect. I have therefore treated the present subject from a point of view which admits such an aspect to be knowable in all vital and spiritual processes. This point of view may seem absurdly fictitious when we consider the present state of exact explanation in the sphere of biology, or again of social science. The generic or analogical judgment now has, and seems likely long to retain, what we may describe as a secondary function; a function not merely of interpreting but of predicting —not merely of resuming sensible facts under higher categories, but of anticipating their actual occurrence. In all science that deals with subjects beyond our power to construct, we draw our conclusions by means of analogical judgment in this secondary sense. When we judge a particular plant of deadly nightshade to be poisonous, or a particular red stag to be dangerous at a certain time of year, we are judging on analogy; on an anticipation based upon a concrete character whose particulars we cannot construct. The precise nature of these inferences will occupy us in the theory of inference; it is plain that the larger part of inexact science consists of them.

We must not confuse analogy in that secondary sense, as a *mere* anticipation of nature[1], with the true generic or analogical judgment which is compatible with complete

[1] Anticipatio naturae.—Bacon.

analytic perception of mechanical cause and effect within the subject considered. We have perfect examples of these latter judgments in the case of things made by man for a purpose; in which a complete and accurate perception of their structure, interior causal nexus, and inevitable course of movement in no way supersedes the summary of their import which a knowledge of their purpose enables us to embody in a generic judgment. When we wind up a watch of which we know the construction, we do not merely anticipate that it will go because we have seen other watches go; we can point to the specific causal connections by which it must (excluding accidents) result that the mainspring, unwinding itself, will draw round the wheels; that the motion passed through the wheels will at one point be regulated by the escapement, &c., &c. If we knew nothing of the use of a uniform measure of succession, but had some experience in mechanics, we should be quite certain that the watch must go, but we should have no notion of its generic content—we should not know 'what a watch is,' i.e. what its purpose is. We could not therefore make the pure generic judgment, 'A watch is a motion regulated by an escapement so as to maintain a uniform rate.' In order to this judgment we must know the purpose of the instrument, viz. to maintain a uniform rate. With this knowledge however we are in a position which, in strict theory, we can never attain with regard to any natural product. We can dictate the generic import of the watch; we can say that if any watch possesses this import imperfectly it is a bad watch; if it possesses it not at all, it is not a watch at all.

Judgments such as this form the ideal to which the universal judgment in the form now under consideration always aspires. The properties expressed in such judgments are not merely anticipated or presumed; they are, or at least may be without altering the nature of the judgment, deducible with the utmost rigour. Yet, again, they are not mere causal sequences; it is possible to have before us all the causal sequences concerned in the object, and yet

not to make the true generic judgment which unites them into a coherent system. In this class of objects we may fearlessly say that it is the purpose which is the essence, and that generic judgment rests on the knowledge of essence. In all other classes of objects such a view has degrees of precariousness, and can only be applied to the purpose as immanent, and therefore as not determinate, and as uncertain in its boundaries. Nevertheless, when we predicate in the organic world 'growth,' 'development,' 'self-preservation,' 'irritability,' we are really referring mechanical processes to an idea of life—an idea of self-relation, of 'inner' and 'outer,' which is a higher result, though it *is* a result, of their purely mechanical nature.

The above is the best account that I can give of the normal generic judgment, which represents the really central phenomena that were designated under the title of Universal Judgment by Formal Logic. The point of view which emerged in comparing this Universal with the Collective Judgment, and which was suggested by the quasi-collective form of the plural subject with 'All,' can never have been really felt to include what the judgment intended to affirm. But, as was said above, 'allness' is undoubtedly *an aspect* of universality.

Existential meaning.

b. In order to bring to a focus the nature of this judgment we have now to consider how its affirmation is to be classed—whether as asserting the existence of fact, or the connection of attributes.

To determine this question, we must recur to the distinction laid down above[1] between abstractness as a character of thought in contrast with sense-perception and abstractness as belonging to a kind of thought as distinguished from concrete thought. Abstractness in the former sense is compatible with individuality, while in the latter sense it is not; and it is in the former sense that we apply the term abstract to the ideas which are subjects in the generic judgment. Thus though we have no longer a proper name as in the singular judgment, yet we have a concrete idea, which being as a whole

[1] p. 228, supra.

capable of reality, presupposes such a reality. We saw that in the case of the demonstratives 'This,' 'Here,' &c. the reality which is the immediate subject cannot be intelligibly taken as affirmed to exist, but only as presupposed. The ideal qualification which sometimes accompanies such demonstratives showed us the point at which presupposition of existence tends to pass into affirmation, simply because a *significant* presupposition can be intelligibly denied. But this tendency is never absolutely fulfilled. The union of actual and ideal qualifications in the demonstrative judgment—e. g. '*This* bad man,' for though he were a good man he would still be *this*—always leaves the ideal qualification the option of being read as a condition. The proper name, again, in its primary function, being void of determinate meaning, presupposes rather than affirms the existence of its content. It only tells you that *some* individual is in question; and you cannot deny that an individual may be in question. But then as the proper name becomes more charged with import, which may even be made explicit in ideal contents as it is in the Corporate Judgment, it also becomes as we saw capable of conditional meaning. Now as the primary function of the proper name can never be cancelled while it remains 'proper,' there arises within the singular judgment a parallel ambiguity to that which arises within the demonstrative judgment. The presupposition that reference is in any case made to actual existence is at war with the determinate qualification which can and will only refer to some determinate existence that may or may not be forthcoming. A determinate, i. e. significant, ideal qualification standing as or in the subject of a judgment is never unambiguously affirmed to be an actual existence. It may always take refuge in a conditional meaning. The reference to actual existence is presupposed *in the sense possible for the subject*; in perceptive judgments because we are never without perception, and in singular judgments because the form of the subject-idea suggests an individual, and reality consists of individuals.

The independence of these two kinds of qualification, ideal and existential, and their consequent liability to contradict one another, is the very root both of existential and of conditional affirmation. In existential affirmation the two qualifications are taken as meant to coincide, though it is a purely material assumption or assertion that they do so; in conditional affirmation the two are allowed to fall apart, i. e. the ideal qualification is not read as implying an individual reality that possesses it.

Returning now to the concrete idea which stands as subject in the generic judgment, 'society,' 'man,' 'art,' 'the bird,' 'the rose,' 'a time-piece,' 'a telescope,' we find the same elements of meaning, but in reversed proportions. The subject here consists technically and primarily of ideal qualification and nothing more. It has reference neither to an unnamed perception nor to a unique individual undetermined by abstract significance. Hence the presupposition that the subject is an actual reality is less prominent, while the abstract conditional import of the ideal content is more so. In the earlier types of judgment we feel that we are referring to reality, and we assent with reluctance to the analysis which shows us that our reference is conditional. In the more abstract forms at any rate of the generic judgment we feel that we are affirming conditionally, and we at once acknowledge our reference to actual reality to be merely implied or presupposed. It will be noticed that I do not admit this side of the antithesis to be completely developed in the simpler generic judgments. I do not think that in 'The rose has pinnate leaves and perigynous flowers' the existence of the subject is merely 'implied' and not 'asserted.' It is not uncommon to find in a manual of botany 'Such and such a variety is no doubt a mistake of the observer,' which shows that the observer's description asserts existence so far as existence is asserted by any judgment[1]. All this however is a mere question of degree. What

[1] It may be said that in such a case the observer has alleged the plant to have been found in a given spot at a given time. But this is not essential; he may simply send in the description.

I am here concerned to show is that the mere *implication* or presupposition of real existence, to which in one way or another we do undoubtedly come in the Universal Judgment, is not extraneous to the affirmation and dependent on a mere fancy or habit of ours, but is the lineal descendant, *mutatis mutandis*, of that so-called existential affirmation which we have traced in perception and in narrative. And the strength of this implication depends on the concreteness of the idea which here forms the immediate subject in judgment. We have then here as before two elements in the content, or rather a content regarded in two lights. We have self-relation, existence, or a categorical aspect, and external relation, necessity, or a hypothetical aspect. But the nature of the generic affirmation, as analysed above, shows for the first time a trace of reconciliation between these two points of view. The concrete self-relation is no longer void of meaning and purely designative; it is a system of assignable import, and the analogy of which we have spoken is the anticipation or the insight based on this import. But again, this analogy introduces relativity and necessity, and as we saw interprets relations that unite the individuality in question with other totalities which prescribe to it either conditions or purposes. Thus the generic judgment is categorical in respect of its concrete self-relation, and hypothetical or necessary in respect of the analogical or constructive nexus to which the import of that self-relation gives rise.

But, it will be objected, this might be all very well if we were speaking of individuals, whose nature is to be unique, like the present Queen of England, or the centre of the material universe; but here we are speaking of an indefinite set or series of individuals whose common nature is nothing and nowhere but in them. This is, it may be urged, Scholastic Realism over again. What existence does a generic judgment presuppose, when and where? In reply to such an objection, I insist in the first place that we cannot treat any imperfection of knowledge as incident to

knowledge unless we can prove that it necessarily is so, and that to treat a natural kind as an indefinite set or series of individuals is an imperfection of knowledge which can be shown not to be necessary. This consideration however belongs to the subsequent section.

But in the second place I reply that even without treating a kind as an actual unity, and though in fact we do not treat it so in judgments which are true of each individual singly (as common generic judgments are), yet still the individuality of the content dictates its own time, place and measure of existence. And it is this time, place and measure, wholly without reference to subjective era [1], place or fancy, that is affirmed [2] in generic judgment. It is characteristic of the rose to exist in a certain epoch of evolution and within certain limits on the earth's surface. Existence within this time and place, subject to such variation as the nature of the content allows, is what the generic judgment affirms (or implies) of the rose; that is to say, in affirming that 'the rose has perigynous flowers' we mean that individual actual roses, found within these limits, have the attribute in question. If there are none such, then the rose is like any genus or species that has been imagined to exist by a mistake of identification; the kind in question would in that case not exist, and the judgment would beyond question be false. Of course in every-day subjective judging the place and time etc. of existence is but roughly indicated by what we happen to know or believe about the actual subject of judgment, but it is never referred to the time or place in which we judge, unless *per accidens* our knowledge is limited to, or the content especially concerns, that time and place. Rose in the

[1] See above, p. 217, discussion on tense in judgment.

[2] I should not object to replacing 'affirmed' by 'implied,' in order to mark the unquestioned line between the singular and the universal judgment, if it were admitted that the implication is an integral part of the judgment, and not a fancy of our own. The point is that existence is implied or affirmed in these judgments, just as Necessary connection is implied or affirmed in Perceptive and Singular judgments.

abstract does not exist. But it is a concrete universal which has power, in the context of the real world to which we refer it, to dictate the epoch, place and quantity of its individual embodiment.

I need hardly guard myself against the misapprehension that I am alleging that anything and everything exists which we choose to fancy. I am maintaining just the opposite, viz. that if we attempt to embody fancied realities in judgment, such judgment is false; for all judgment is a definition of real reality. We can only escape this result if the fancied content is such as is in its logical nature debarred from being real, i. e. a mere abstraction, and is therefore incapable of claiming to stand for a reality.

Individual Generic Judgment.

c. The reality involved in a concrete universal will be made plain by insisting on a third aspect of the generic judgment, viz. that in which it challenges comparison with the Corporate Judgment. For this purpose we must think of generic judgments which are not merely analogical, but which for want of a better term I may designate as Individual. These judgments are characterised by not being true of any and every individual singly, but only of the kind taken as an individual. Such judgments are, 'The animal world represents an evolution coordinate with that of the plant world,' 'The Orchidean order includes 433 genera and probably about 6000 species,' 'Space has three dimensions,' 'Humanity is the object of worship to Positivists,' 'Monarchy disappears with the advance of civilisation.'

In comparing such judgments as the above with that form of the Singular Judgment which we called the Corporate Judgment, we find at first sight little distinction between them beyond the fact that these Generic Judgments do not employ a proper name in the subject, whereas the Corporate Judgments do. And even this distinction is in some degree bridged over when we call to mind that such determinations as 'now,' 'last year,' 'this,' and 'mine' appeared to us essentially to rank either

with proper names or with demonstratives; and also that there is a tendency on the part of proper names themselves to assume abstract significance, so that a proper name is not always easily distinguished from a generic name. The Greek race, Europe, are proper names; but it is more doubtful how we should class 'the Aryan languages,' 'the North Pole,' and 'the Mahometan religion.' Again, 'the earth,' 'the solar system,' seem free from all arbitrary reference; but in speaking of them we really imply 'our earth,' 'our solar system,' and so fall back into some form of the singular judgment.

The difficulty is worth noticing; but it is simply one of those which must arise from the Sorites-like character of any continuous evolution. It is hard to say whether 'the Mahometan religion,' as we mean to employ the term, involves a reference strictly of the order of a proper name[1], or on the other hand is simply an ideal content, and, so far as ideal, abstract. The reason of this is that the conception is *in fact* on the border-land between the proper name and the mere determinate content, and in all probability it is sometimes employed in the one sense and sometimes in the other. The question is whether the general meaning or the individual identification comes first in the mind. As we saw above, it is not improbable that in primitive careless and unscientific thought the significant word is not made distinct from the proper name—in other words, the intension which is the mere means to identification is the only intension signified, but for this very reason the purpose of identification is not distinguished, so as to be considered primary, from the purpose of definition. In fact, when we now speak colloquially of 'the bay mare,' 'the low pasture-field,' we are using 'bay' and 'low' merely as signs of identification, though of course by help

[1] In every case we must keep etymology out of the question. The reference to Mahomet as a historical individual is certainly not the chief element, and perhaps hardly an essential element at all, in the direct significance of 'Mahometan' at the present day. Cp. the rhetorical antithesis that has been drawn between 'Christianity' and 'the religion of Jesus.'

of their meaning. Such is the type of usage which we may imagine to have been the common root of the significant and the proper name. The terms of the Linnaean arrangement of plants, in as far as they are subservient to mere recognition, are a somewhat similar case in point.

But when all deductions are made, there remains a clear distinction of principle between judgments which use proper names, and judgments which do not. From this point of view the generic judgments now before us agree with those last discussed and contrast with the singular judgment. They are able to convey their reference to reality by means of a determinate ideal content.

On the other hand, in the *nature* of their reference to reality they agree with the singular judgment and differ from the common generic judgment. They do not rest on analogy. The individual to which they refer is a real and a single individual, and not a mere individuality. So far from being mediated predications about a number of particulars they are not even true of the particulars that enter into their content. When we said, in the former section, 'The rose has perigynous flowers,' we were treating the individuality of all roses as one by analogy[1]. But when we say, 'The rose family is a descendant of x, a divergence from y, and a transition towards z,' such a judgment is not made about each particular plant within the tribe, nor even about each particular species. If true, it is true of the whole section of plant-life in which every particular rose-plant is a distinct and separate progressive or divergent phase. There can be no doubt, I think, that from

[1] Subtlety of transition must have an end somewhere *in writing*, but *in fact* it has none. Thus the reader may object that if it is nonsense to say that the rose family as an actual individual has perigynous flowers, yet we may always safely say in such a case that it prescribes that the particular rose shall have perigynous flowers. I can only admit the objection; the fact is so *if* we are *bona fide* regarding the genus as a whole of evolution, whose actual individuality expresses itself in this and in other common predicates. But if as is most probable we realise nothing of the kind, but are merely going by analogy to a common property of roses, then we are treating the kind as a mere individuality, and must not pretend to be treating it as an individual.

an ideal point of view every natural kind in the concrete sensible world must be thus regarded; and of course when we consider existences in which Intelligence is more definitely active—society, mankind or at least civilised man, fine art, or morality—in these phenomena the totality is more real and concrete, and the reciprocal relations of its parts exist not merely for the microscope of analysis, but as patent every-day facts.

Although universal, the Generic judgment in the aspect now before us is fully Categorical. It is in this respect wholly on a level with the Singular judgment, being in fact related to the judgment of Analogy with its dual nature much as the Singular judgment is related to the proportional or comparative judgments that are introduced by a demonstrative. The Singular judgment may be regarded as a *premature* attempt to concentrate individuality—the 'characteristic quality' which the proportional judgment had revealed—into an individual; resulting as we saw in the omission of determinate quality from the individual content by the use of Proper Names. The generic judgment raises (in its Analogical form) and meets (in its Individual form) the same problem in a more adequate way, concentrating individuality into an individual by completion and not by omission. It is as a system of such individuals, united perhaps in a yet more concrete individual reality, that we must conceive of the world known to us through space and time, if we are to assign it any existence beyond the present of presentation. *For us*, it is plain, such individuals are intellectual constructions, and only attached to, not shut up within, the actual present perception. The distinction between concrete realities and abstract truths is not, for us at any rate, that the latter are intellectually initiated and the former are not; it is not a question of origin, but a question of nature, i.e. of the degree in which a content is capable of being regarded as something that exists as a whole and can be considered in relation to itself, or on the other hand is incapable of being given as a whole

and affords no matter for consideration in relation to itself. All contents must theoretically be regarded as combining these two characters; and as an important application of this idea I may instance the answer to a question which arises when we make the categorical nature of assertion depend upon the degree of concrete self-relation.

Is it possible, we shall be asked, to lay down a hard and fast line, by which abstract shall be divided from concrete contents? And if not, does not our view surrender the self-dependence of reality and make it purely relative to fancies and notions in the individual mind? Does it not enable us to treat as actual any content however abstract or trivial, and any however concrete or significant as a mere element in hypothesis, simply by varying the point of view from which we regard them? And the answer is, that as reality unites these two characteristics, we can always emphasise either at will; and further, we commit no error in so doing, unless we assume and assert the relation which we happen to be considering to be the only relation that there is. Our knowledge always falls short of reality, and apart from false identification of relations—with which false antithesis is at bottom the same—we have a right to see all that we can either of absoluteness or of relativity in any content whatever. Reality is such that any element or feature of it, however slight or superficial, can be raised by our intellectual gaze to the position of a self-related significant whole. The nature of mind is present in everything; the only difficulty is to see it there. And such an elevation is not false, except in as far as it is exceptional; in as far, that is, as we fail to view the remaining contents of reality with the same constructive insight. Not merely a fragment of stone or metal, but a colour, a curve, a relation of size or weight, is ideally capable of being passed through the stages of generic judgment, of being regarded first as an individuality, and then as an individual. What is false or forced in such a mode of contemplation depends on the want of proportion between it and our ordinary careless vision of organisms

and fine art, of men and of society. All contents are relative except the absolute; but the import and degree of their relativity is not the same.

A further corollary may be worth drawing in a few words from the above considerations. Our present treatment of logic starts from the individual mind, as that within which we have the actual facts of intelligence which we are attempting to interpret into a system. But our consequent preoccupation with the phenomena of the individual mind, with its imperfect grasp of reality and the varying aims and tendencies of its thought, brings with it a double danger which haunts every phrase and every idea in a logical treatise. Either one may speak as if reality were simply relative to the individual mind, a ridiculous idea, but one which the very caution required of a modern writer is apt to encourage; for he hardly dares to allude to Mind as such or in itself; or one may become interested in tracing the germination and growth of ideas in the individual mind as typical facts indeed, but only as one animal's habits are typical of those of others, and so we may slur over the primary basis of logic, which is its relation to reality. For mental facts unrelated to Reality are not knowledge, and therefore have no place in Logic. The difficulty is, in other words, simply that modern Logic has a hard task to hold its own between Metaphysics and Psychology. I entertain no doubt that in content Logic is one with Metaphysics, and differs if at all simply in mode of treatment—in tracing the evolution of knowledge in the light of its value and import, instead of attempting to summarise its value and import apart from the details of its evolution. My object however in mentioning the difficulty at this point is merely to protest that though I assume reality as the norm of the mind, in constructing which it is reconstructing and not creating *de novo* out of itself, yet I can entertain no doubt that intelligence is essential to the being of Reality, and that an abstraction which tries to regard the one apart from the other is a hopeless and helpless self-contradiction. As a

working conception in Logic we are forced to adopt some such idea as that of a normal intelligence operative in all human minds, but subject to the accidental limitations of each. The evolution of knowledge is, as Plato long ago portrayed it, the emancipation of individual minds from their accidental limitations, and their education into the knowledge of the one real and intelligible world. But the duty of modern science is to preserve the continuity of this evolution, and to admit no *saltus* at any point between the world in which we live and the world which is real and intelligible. And in this continuity we have a standpoint which Plato, although he reached it, did not consistently maintain. Objective Intelligence presents itself in Logic as the mere postulate required by such a continuity, and, starting as we have done from the individual consciousness in time, it is merely as a postulate that we propose to treat it. To say that the real world is the intelligible world is only to repeat what we found ourselves obliged to suggest as an elucidation of the earlier stages of judgment, that reality is something at which we arrive by a constructive process[1].

We are now to consider the consequence of emphasising the abstract or relative aspect of the Analogical judgment. We are thus led to a form of thought which is antithetical to the Individual Generic judgment of which we have just been speaking, and consequently must be regarded as a divergence from the concrete evolution of thought towards the mechanical or analytic judgments which begin with enumeration.

[1] See above, Introduction, p. 41 ff.

CHAPTER VI.

UNIVERSAL JUDGMENT (*continued*).

Pure Hypothetical Judgment.

ii. THE Universal Judgment, when pushed to the extreme point of abstraction, becomes the Hypothetical Judgment.

Its relation to previous forms.

a. The Hypothetical Judgment is distinguished from all which have thus far been spoken of, by its essentially abstract character; abstract not merely as thought is said to be abstract when compared with sense-perception, but as the thought of an ideally isolated attribute is abstract compared with the thought of a self-dependent and self-related individual. It represents the fourth of the elements or aspects which have been confounded, or at any rate have not been duly distinguished, by traditional logic within the so-called Universal Judgment. Its differentia is that it does not refer to a concrete subject, not even to what we called an individuality or the concrete self-related content in its aspect of self-relatedness; and that consequently we do not consider whether its subject is given in actuality or not. For it is essentially the judgment of necessity or relativity, in which the subject is taken, not given, and taken not for its own sake nor with reference to its individuality, but for the sake of that which is to follow from it, that is, for the sake of its relativity. It is a judgment which follows out the single thread of a nexus of attributes, and does not heed the import of the pattern into which it enters. If a gravitating body is set free to fall, it falls with an acceleration proportional to the squares of the times, whether it is a drop of rain, or a tortoise with the head of Aeschylus below it. Here we have, in an explicit shape, the relativity of knowledge which has haunted us throughout the evolution of judgment, forbidding us to feel satisfied in connecting

together any data which we might merely chance to light upon in conjunction, and requiring that every idea should always be limited and controlled by its reference to something else, and not simply taken as we find it in perception or in ordinary life. And just because this principle has so haunted us, the judgment that embodies it cannot be sharply severed in meaning from the earlier forms of the universal judgment, and even the quasi-collective 'All gravitating bodies etc.' may, and most frequently *in this case* does, contain what is really meant as a hypothetical affirmation. '*In this case*,' for the distinction really goes, as we have maintained all through, not by the shape of the proposition, but by the content of the judgment. The connection however between all the types of universal judgment is intimate and essential, so that in popular usage one easily slides into the other, or even combines the other with itself as its ground or consequence. When I say 'All animals need food' I am probably expressing a *quasi-collective* conclusion about a property shared by all species of animals, taking its significance from an *analogical* perception of the generic function and immanent purpose of animal life, but ultimately resting on the *hypothetical judgment*, expressing a *necessary or relative* principle, 'If force is to be expended it must be supplied.' It will be observed that the second type of generic judgment, which for want of a better name I have called Individual Generic, is omitted from this combination of aspects. It represents a tendency divergent from that of the Hypothetical assertion, while the Analogical judgment is undecided between the two. If the Individual Generic judgment is capable of combination with the Hypothetical, we must look for the result in the Disjunctive and not in the Universal affirmation.

External Form.

β. The type of the Hypothetical Judgment in traditional logic, so far as it is recognised at all, is stated in one of three forms: 'If A is B is;' 'If A is B, then C is D;' and 'If A is B, then it is C.' The third of these forms is that which guides us to the true import of the judgment, though

conformably to the habitual irrelevancy of popular thought the second is that most commonly in use. But this second is obviously a broken-backed sequence, in which no point of unity is formally recognised between the antecedent and the consequent. When, indeed, significant words are substituted for letters, the unity would generally be obvious, supposing the sequence to have scientific value at all; but in such a case the expression is not essentially distinguishable from that of the third form. The first form, 'If A is then B is,' has been said to be an abbreviation in which letters stand for clauses; in that sense of course it must be reducible to either the second or the third form. We get the same result if we try to take it as a combination of single-word or impersonal predications. Contents may undoubtedly be ascribed in judgment to an unanalysed present, but an unanalysed present can form no bond of union for a necessary sequence. 'If guilty, then death' is a mere linguistic abbreviation for 'If he is guilty then he will be put to death.' And even 'Where there is smoke, there is fire' superadds to the impersonal 'There is' a true local particle in the 'where' of the antecedent, and this reacts by a curious equivocation on the impersonal 'there' of the consequent. No doubt, but for the awkwardness of the expression, we should say, '*Where* there is smoke, *there* there is fire.' Here again, then, we have in essential meaning the third type of the Hypothetical judgment, 'If A is B, it (A) is C.' I will next illustrate the transformation of type ii. into type iii. 'If the barometer (A) falls (B), the weather (C) becomes stormy (D)'. 'If the atmosphere (A) decreases its pressure locally (B), it (A) must leave a gradient for wind (C).' But now if we take the lines,

'. . . when in Salamanca's cave
Him listed his magic wand to wave,
The bells would ring in Notre Dame,'

we find that the *saltus* from antecedent to consequent is all but essential to the judgment; the point of the mystery is that we cannot get at the underlying unity. Thus we see

the extreme case of type ii. in a judgment which has for its object to assert magical, i. e. irrational, connection. Of course the general scheme of reduction would have to be, 'When his magical power (A) was exerted (B), it (A) could act at any distance (C).' It is in this sense that Schopenhauer calls some of Euclid's demonstrations conjuring tricks, because, although in a demonstration some unity of course must be shown between antecedent and consequent, yet the unity shown is often not central or fundamental [1], and is therefore a *causa cognoscendi*, and not a *causa essendi*. In the pure type, 'If A is B, then C is D,' we have no indication even of a *causa cognoscendi*.

Much more might be said about the forms of conditional sentence; but the subject is really grammatical rather than logical, for the hypothetical judgment can be expressed without a conditional sentence at all. Hypothetical and Categorical Judgment, as we understand the terms, are a question of content, not of grammatical form, and the hypothetical judgment is found wherever we frame assertions about an abstract content, in the above sense of abstractness; although there is a difference of adequacy in different grammatical expressions for any kind of judgment, and the conditional sentence resists any attempt to embody in it a purely categorical meaning. 'If this man dies, our cause is lost,' takes 'this' as a sign of unanalysed content and not as a point of attachment in reality. We know that the reason is somewhere in the unanalysed content, and so take it as an antecedent in the lump [2].

Assertion made by Hypothetical Judgment.

γ. What is the precise nature of the assertion conveyed by a Hypothetical Judgment? In answer to this question I shall speak first of the idea of Ground or nexus in general, secondly of Ground as compared with Cause, and thirdly illustrate our view by the attitude of the individual mind in hypothesis or supposition.

[1] Schopenhauer, Werke, i. 136 ff.

[2] I take this analysis, which appears to me exceedingly felicitous, from Bradley's Principles of Logic, pp. 89-90.

The idea of Ground.

a. The contrast which we have anticipated throughout the above account of judgment determines the central attribute which we are now to consider. The content of a true hypothetical judgment is abstract; abstract in itself and not merely by the absence of sensuous perception. In other words, the subject of a hypothetical judgment is not an individual, not a whole, nor anything considered as a whole, i.e. as a self-related system. On the contrary, the content of a hypothetical judgment is composed of ground and consequent, each referring to something other than itself, and hence essentially a part. For a system as a whole, such as space, or the totality of gravitating matter, or the British Constitution, is a mere fact, complete in itself, and neither a ground for nor a conclusion from anything else[1]. It is only as parts within a system that elements can be so relative to one another that '*if* this is *so*, then that must be *so*.'

It is only a question of detail how far the system in and by which the nexus subsists, is itself made explicit as a content within the hypothetical judgment. We may say, if we like, that the ideal of logical sequence demands that the system as a totality should be so made explicit, because the system is the real ground of the nexus; and if the system does not appear in the content, the real ground does not appear in the content. But this argument, from the comprehensiveness of the real ground, does not overcome the essential principle which is involved in there being a ground, as ground, at all. Ground implies a consequent other than, though fundamentally one with, itself. This transition or otherness ceases to exist if the content does not formally present itself as part to part. For say that the totality of the system is explicit in the ground, still this totality is depressed into the relation of a part by the fact that a part is selected to appear over again as

[1] This applies to the examples given only when considered with reference to their internal nature. It may be said that space implies an intelligence; but this is as within a further whole. There is of course no ultimately Absolute whole except *the* Absolute whole.

consequent, and so as formally at least external to the ground. Thus it remains true that the elements of content in a hypothetical judgment are related as other to other within an identity which determines the one on the basis of the other. Such an identity, as far as exhibited in the one term that, in virtue of it, determines the other, is what we mean by Ground. It is obviously capable of all degrees of completeness up to the ultimate fact or whole which embraces in itself as parts both ground and consequent commonly so called. The various degrees of imperfection or broken-backedness in Hypothetical judgments, such for instance as were illustrated in the last section, are simply the degrees in which the system that determines the nexus fails to manifest itself within the content connected. It must not be forgotten however that we have refused to treat the grammatical form of propositions as decisive of the character of judgments. Where no rational nexus is traceable, but only a coincidence in fact, however general, we cannot admit that the essentials of hypothetical judgment are present. But then if we are impelled to make a judgment in hypothetical form, there always is some presumption of a rational nexus. We shall consider in the following section what attributes of true hypothetical judgments are shared by analogical assertions such as 'If he is a negro, he has woolly hair.' It is not worth while to insist more fully on these degrees of imperfection, except in so far as they will come under our notice in dealing with the doctrine of causation and with the kindred subject of the negative in hypothetical judgment.

Let us attempt to make perfectly clear, before we go further, the nature of the relativity within a system which we ascribe to the contents before us. The simplest cases of such relativity are drawn from the field of numerical or geometrical construction. A Chinese puzzle or dissected map may give us a first idea. Any selected piece out of such an arrangement determines nothing by itself, but when a second piece is given some relation between them

emerges, though perhaps only a negative one. It is further possible for a piece entirely enclosed by others to have its place relatively to them determined long before the whole arrangement is completed; but this determination will really be partial, for the place of the whole group of pieces cannot be determined till the whole puzzle is put together. Now the arrangement *as a whole* is a mere matter of fact; it is only within it and by reason of it that each piece has a prescribed place in virtue of its own shape combined with the shapes of all the other pieces. All the pieces being given, of course the arrangement is given too; but if nothing is given, of course all is in the air, and one arrangement and set of shapes is as likely as another.

Or again in the region of number, we may take as equivalent to Hypothetical judgments those which in treating of Enumeration we called Mediate. $50 \times 3 = 25 \times 6$ would run in conditional language, 'If 50 is multiplied by 3, the product is equal to,' etc. Here we have one form of the numerical whole 150 presented as a term from which another term, viz. another form of the same whole, may be inferred. The system within which the relation exists is of course not the whole 150, but the system of number as such; or we may say if we prefer, the whole 150 as involving and exemplifying the nature of the whole of number as such. This system may be brought to bear either by simple counting, the process which is so to speak the medium in which number exists; or by developing any of the relations which are embodied in the several places of the series with their individual names. Thus the above statement may at once be reduced to a tautology by taking 50 as 25×2 and 6 as 2×3. The combinations which might be made with the same result might be pursued as long as we cared to continue the enumeration of places in the series, and from whatever point we started in the system we should obtain the same result so long as both sides of the equation were subjected to treatment that was equivalent according to the rules of the system. On

the other hand, if we were to assume the invalidity of the equation, we should at once make the whole numerical system inconceivable—a unit, say, would have to be taken as varying in value without being subjected to any arithmetical process, and such variation is incompatible with the fundamental principle of number.

The same may be shown in space, treating it not *qua* extended whole of parts outside one another, but in respect of the connection of its attributes. 'If two straight lines have the same direction, they can never meet.' This is a consequence drawn from the conception of direction in homogeneous space. If we destroy the idea of homogeneous space, the relation, which only holds within a totality having that attribute, is annihilated. If there can be a change of direction which yet is not a change of direction—I do not know how else to express the notion of direction in space which is itself curved—then, I presume, the judgment from which we started is no longer true.

The same characteristic might be pointed out in relation to gravity, inertia, or any property which is the basis of exact inference. The consequences of gravity hold only within the totality of gravitating matter, of inertia in the combination of motions, and so forth. Every sphere of this kind, every set of relations within which certain nexus of attributes hold good, is itself ultimately a *fact* or datum, relative no doubt within some further totality, but absolute relatively to the inferences drawn within it. Hence we are brought to a conclusion of the last importance. All hypothetical judgment rests on a categorical basis. That is to say, all relativity rests on an absolute datum and all necessity on fact. Why then is mechanism, necessity or relativity, opposed to individuality, fact or absoluteness, if all mechanical relations are themselves characteristics given in some individual whole[1]? The answer seems to be dic-

[1] Space and Time are as we saw imperfect individualities. But it is their individuality and not their imperfection that makes them sources of general relations in things.

tated by what has been said. Individuality is in self-relation, Necessity is in external relation. But as all relation is within some whole, it follows that wherever we have necessity or relativity we are concerned with more than one whole or individual content; that is to say, we have a whole or content with its own import and significance taken as a part within a wider or completer totality[1]. The ground or necessity which forms the affirmed nexus of attributes lies then in the systematic nature of the wider whole, that within which the terms of the nexus are capable of being opposed as part to part.

We will examine two or three instances of ground and consequent in the light of the above doctrine. 'A picture 6 ft. × 7 ft. cannot be hung in a space 5 ft. × 6 ft.' Here we are taking the picture as a whole in itself, but as a part within space, and as therefore having external relations determined by the spatial system as including other objects. The arrangement of other spatial objects so as to leave only the area 5 ft. × 6 ft. is incompatible with the occupation of the area 6 ft. × 7 ft. by the picture. But again, we may judge that 'If the boat in the right foreground of the picture were erased, the arrangement of the distances would become confused.' In this judgment we still call attention to spatial determinations, but only as involved in the concrete individuality of the work of art, which assigns them their meaning and value. We are thus taking not space as such, but the individual picture before us, as the totality or determining system, and contemplating the necessary relations which this fact or whole, from its nature and structure, imposes on its several parts. Of course, apart from the effect of the whole picture, there would be no such necessity or relation between the parts. This is an illustration of the ultimate nature of logical necessity or relativity and its relation to fact, which is, if not specially felicitous, at least true in every detail. In a true work of art we have the bearing of every part on every other, the innumerable de-

[1] See on Measurement, chap. iii, supra.

tails, none of which could be altered without necessitating the alteration of others, all concentrated in a unity which is itself constituted by all these parts, and yet, as a whole, prescribes the relations existing between them. And yet the whole is itself a comprehensive *fact*, and apart from it or outside it all these prescribed relations lose their necessity and disappear.

Again, take such a judgment as 'The sound of the violin is of peculiarly piercing quality.' If we describe the sound merely in terms of the mechanical system of vibratory movements, it is governed by the necessary relation, 'If a string be dragged by a bow, slipping from it at intervals, its vibration is of highly angular form,' i.e. in terms of its effect on the air, produces sharp and not gradual transitions from increase to decrease of condensation. Omitting the effect on our hearing, this is a nexus of attributes grounded in the properties of vibrating bodies, and in the laws of friction and of undulatory transmission. But here again the whole system of physical properties, though comprehensive, is a datum, and except in it no necessity could be shown why motion communicated by a bow must have this particular form, or why this particular form should find a correlative in a peculiar type of impulse communicated to the air. It is this system which as an identity in differences appears first in the effect of the bow on the string, and then in the peculiar impulses communicated to the air by the sounding-board. It is only as having such a unity behind both of them that the one of these phenomena can condition the other. And here again we may obtain a relative absolute by considering the compound tone of the violin string as perceived by the mind through the ear, simply on its own merits. It then becomes an ultimate fact, embodying certain relations between musical sounds. And within this fact we may distinguish the necessary relation, 'When a tone is piercing in quality, the higher overtones are strongly marked in it.' And finally, we may bring the physical and the musical system together under

the complex fact of the correspondence between the shape of oscillations and the character of tones, and say on the faith of this complex fact that where the oscillations are angular, the higher overtones are audible, and proceed to the whole system of deductions made possible by Fourier's analysis of all vibrations into combined single oscillations.

The idea on which we have been insisting—that of a system or unity which prescribes the relation between its parts or differences—is the idea of Ground, which includes the sphere of the Hypothetical Judgment, and indeed wherever it appears may be said to involve a Hypothetical element. It is difficult to express the essence of this conception otherwise than by saying that the system is the same in the one difference or aspect as it is in the other. We thus appeal to the notion of identity in difference, which we have taken throughout to be the content of judgment. Only, as Ground, it is not *mere* identity, but *systematic* Identity, a notion easier to illustrate than to define, but apparently equivalent to 'identity such that the differences in which it is manifested have definite relations to one another.' Of course any such definition only repeats the characteristic which the account of the Hypothetical Judgment presupposes.

Assuming however these characteristics as summarised in the above definition, we can draw from them two consequences that affect the idea of Ground. First, it is plain that when once a Ground is rightly stated, in conformity with the true nature of the system which it presupposes, and with which it is in fact identical, such a Ground is unalterable except by alteration of this system itself. With what justification, theoretically, we refuse to contemplate such alteration of the universe as a whole, or how far practically we permit ourselves to contemplate it in respect of subordinate systems, e.g. man's moral nature or the type of disease, are questions that must be reserved for a general discussion of the postulates of knowledge. Formally, we may say, the whole cannot alter, because any alteration

must be included in the whole. But we shall see that so purely formal a postulate would not satisfy the purposes for which a postulate is required.

And secondly, it is plain that a ground is not rightly stated unless it either embodies the whole essence of the system which constitutes the ground, or at least is exactly relevant to or compatible with that system, and to the particular bearing which a given interest in any context imposes upon it. In the former case it is clear from what has been said that the hypothetical judgment must tend to expand itself into a categorical one. When we go to the root e.g. of geometrical truths we find ourselves affirming facts regarding the nature of space. We shall thus at a later stage have to face the conception of judgments at once categorical and necessary; we have indeed anticipated something of the kind in speaking of the individual generic judgments. The latter case is that which gives rise to hypothetical judgments having strict reference to a systematic ground, which they therefore imply, but do not need to express. Such are the ordinary statements of 'pure cases' in exact science, or geometrical truths as commonly treated without raising fundamental questions of the nature of space. A 'pure case' is a nexus of differences reduced to their expression as the differences of the system in which they have their nexus. Without knowledge of such a system we may analyse *ad infinitum* and yet never be sure that we have obtained a 'pure case.' This has, as we shall see, an important bearing on the theory of Induction. I gave a rough instance of a pure case on p. 234 in reference to the annual rings of exogenous trees. Such, again, are the mechanical and chemical elements in the vital processes of man, e.g. the pumping action of the heart, the oxidation of the carbon in the blood and so forth, in stating any one of which as a necessary sequence of ground and consequent it must be treated as belonging to its own mechanical or chemical world, and not as an element in human life. All such judgments are abstract in the fullest

sense, and analytic; their very point is that they disregard the import which constitutes the individual. On the other hand, a system which is the combination of individuals in their full import, i.e. the state in relation to moral beings within it, is most naturally dealt with not in hypothetical but in categorical judgments. For the subject is either the concrete system itself, or an individuality subordinate to it, taken in its full concreteness. It would be sheer pedantry to speak in hypothetical language of man's moral being, its ground, and its necessary relations.

It is a corollary from the idea of Ground as a relation purely relevant to a positive determinate system that the hypothetical judgment, when ideally complete, must be a reciprocal judgment. 'If A is B, it is C' must justify the inference 'If A is C, it is B.' We are of course in the habit of dealing with hypothetical judgments which will not admit of any such conversion, and the rules of logic accept this limitation as they accept the custom of ordinary speech as to the comparative range of subject and predication. Some cases of non-reciprocal sequence and their justification will be considered in the next section. But here we are only concerned to explain the principle upon which necessary sequence must ultimately rest; and according to that principle, the unity of a system in its determinations, it follows that if A B necessitates A C, then A C must also necessitate A B. We are not now speaking of causation, but simply of coherence in principle, and it is obvious that the idea of coherence in a system is reciprocal. A cannot cohere with B unless B coheres with A. If in actual fact this is found not to hold good, and A B is found to involve A C while A C does not involve A B, it is plain that what was relevant to A C was not really A B but some element $\alpha\,\beta$ within it. 'But may not the irrelevant element be just the element which made A B into A B as distinct from A C, so that by abstracting from it A B is reduced to A C, and the judgment is made a tautology, i. e. destroyed?' The suggestion is tempting, because it aims at cutting up by the

root a troublesome scientific problem, viz. the statement of connected attributes as purely relevant to one another and yet as distinct. We constantly tend either to insert irrelevancies by way of distinction, or to let both attributes fall back into the undistinguished abstract relation which connects them. To grasp a distinction in unity is an effort, and we dislike effort. Nevertheless, if it were impossible, the idea of system, of the one in the many, would be gone. A systematic relation is always within an individual whole, and the priority or antecedence of its elements belongs to the imperfection of knowledge, and not to the relation in itself. I am not saying that every individual reality exists endlessly in time, but I am saying that every whole in as far as its parts form a system has a nature which is independent of time, or (what really comes to the same thing) continues positively and actively through the fugitive moments of time.

But apart from time on the one hand and irrelevant elements on the other, I cannot see how the relation of conditioning differs from that of being conditioned. Every B that is conditioned by A is the condition of A being such as to condition B, i. e. of A being what A is; and if the being of A were wholly relevant to B, this would be equivalent to saying that the existence of B involves the existence of A. In other words, if there is nothing in A beyond what is necessary to B, then B involves A just as much as A involves B. But if A contains irrelevant elements, then of course the relation becomes one-sided, as if we were to say that a plane section of a sphere has its radii equal. The mention of the sphere makes the relation of coherence one-sided; the circle need not be regarded as a section of a sphere. But, always assuming the homogeneous nature of Space, the relation between equidistance from a central point and uniformity of curve is inseparable, and it is impossible to see that either of these essential differences of the circle is prior to the other. It may however be questioned whether in an ultimate sense any incomplete case can be pure, i. e. whether irrelevancy can be wholly

avoided except by including the whole fact to which the judgment belongs. What, e. g. has distance to do with curvature? The only answer is in the nature of space. This amounts to a doubt whether in the end any Hypothetical Judgment can be true, and points us again to a further type of judgment in which such deficiencies may be made good.

The relation of Ground is thus essentially reciprocal, and it is only because the 'grounds' alleged in every-day life are burdened with irrelevant matter or confused with causation in time, that we consider the Hypothetical Judgment to be in its nature not reversible. The habit of thought is to proceed by determining an undetermined datum; and this habit is never wholly laid aside even in the Hypothetical Judgment which is theoretically its negation. But a given condition, though interpreted in a single aspect by the judgment which draws its consequence, may have other consequences just for the same reason for which its consequent may have other (alternative, not merely co-operative) conditions. The 'other' conditions arise through a variation of the irrelevancy present in the given condition; as, if a circle has been said to arise through cutting a sphere in a plane, this condition may be varied by altering the superfluous relation in which a plane figure bounded by a line equidistant from the centre can be regarded; e. g. it may be taken as a section of a cone, or as an ellipse with equal axes. And just as each of these irrelevancies would present the antecedent of circular curvature in different garb, so the presence of an irrelevancy which is thus capable of variation involves all the independent consequences that follow from the irrelevant idea—in this case that of a sphere-section—which has been included in the condition. If we restrict ourselves to the relation of equidistance in a plane, we can get no result beyond that of a circular figure with the properties which belong to it in the geometrical system.

A ground that admits of such variation is not only partial or abstract, i.e. one which leaves the true ground in a measure to be understood, but is actually in part 'impure,' i. e. burdened

with matter which gives rise to diverging consequences, and makes the ground itself one among many converging grounds.

We have thus seen the idea of Ground in three aspects; as an actual system, interpreted in its bearing upon its parts; as a 'pure case,' i. e. a factor within a system stated in terms precisely relevant to the system and entering into a nexus in virtue of that system; and as an 'impure case,' i. e. a condition weighted with irrelevant matter and so failing to express the real nexus which is aimed at. The first of these three is necessarily categorical in import, and may perhaps be identified with Schopenhauer's 'Seyns-Grund,' or Ground of Being; the two others are primarily hypothetical and only *imply* reality behind them, and correspond together to his *Erkenntnissgrund*, or Ground of Knowledge. It need hardly be remarked that the ground of Being is also the only genuine and complete ground of knowledge. In respect of reciprocal character they must be divided differently; the first two, the complete and the abstract ground, being necessarily reciprocal with their consequents, and the third being as obviously not so.

The idea of cause.

b. Cause may correspond either to the complete form or to the incomplete forms of Ground. In the former sense it can scarcely be taken to differ from ground at all. In the latter sense it is a distinct species which is included in a common genus with the incomplete forms of Ground.

Cause as complete Ground.

(1) Cause[1] as corresponding in meaning to complete Ground would consist in the exhibition of some selected attribute or event—the effect—in the totality of systematic relations which constitute its necessity. And in such meaning it can scarcely be taken to differ from Ground, because the temporal succession, which seems the natural differentia of Causation, disappears in the reference of the effect to a positive and continuous system. Mere temporal relation is negative, is nothing. It is only the unity behind the temporal relation that can bind cause to its effect; and in

[1] On the conception of Cause, see some very acute remarks of Professor Clifford, Lectures and Essays, i. 150.

the real or complete Ground this unity is made explicit. The cause of the earth's being where it is at this moment may indeed be popularly indicated by saying that it was, wherever it was, at the previous moment; but strictly of course the relation of the present position to the last position when fixed before the mind as discrete and successive in time, is simply that the one is not the other, which is so far the same relation that subsists between the earth's present position and the sun's or moon's last position, and amounts to nothing at all. The cause of the earth's present position is the persistent velocity, together with the persistent influences regulating the direction, of its passage through space. This meaning of Cause is the ideal logical import of the term, and is what Mill meant to indicate when he defined Cause as the 'sum of the conditions.' The word 'sum' is unfortunate, because it indicates a special way which may be inappropriate of combining the factors. The totality of the relations would be a better phrase than the sum of the conditions.

The only difference between Cause in this sense and Ground would be that Cause, though not a sensible event, still retains an import relative to the explanation of sensible events or of attributes entering into events (character, health, etc.), and is therefore not coextensive with Ground, which includes e. g. geometrical relations where the phenomena of process in time are wholly wanting. There would be no sense in saying that the attributes of a triangle are the cause of those of parallel straight lines, or *vice versa*[1]. The distinction, however, is more one of usage than of theory. On the one hand, the effect, subsequent in time, which is exhibited as one relation or difference within a necessary nexus, is necessary to the persistence of the whole system and to the evolution of its significance, so that the parts of the unity or system are reciprocally necessary in *complete* Cause as in complete Ground; and on the

[1] Schopenhauer's 'Seynsgrund' describes the relation of such cases, supposing the rational connection to be central and fundamental to the contents connected.

other hand, if in investigating a ground, say in geometrical matter, we go back to the whole system of fact which is at the root of the necessary connection, we shall be justified in treating this fact as a Cause. We could hardly be censured for saying that the nature of space is not only the ground, but the cause, of the attributes of triangles and of parallels alike.

Cause then, in its largest sense, is a real ground, and ultimately there is no complete ground which is not a real ground. Ground and Cause are thus not co-ordinate but convergent conceptions, i.e. as they are completed they tend to coincide, and the striking differences between them depend on a comparison of their imperfect and ultimately self-contradictory forms.

Complete Cause, like complete Ground, corresponds to a Hypothetical Judgment whose condition and consequent are reciprocal. If, as is perhaps the case in Mill, the phrase 'sum of the conditions' is not limited to relevant conditions, and the hypothetical judgment which expresses the nexus of such a sum with its effect is consequently not reciprocal [1], the notion of sum of conditions loses the only merit which it appeared to possess. But if it means, as it seems to mean, a persistent and systematic fact, then it agrees with other indications in suggesting that for the complete Ground *or* the complete Cause we must go beyond the Hypothetical Judgment.

Cause as an event, distinct from Ground.

(2) Cause as an event in time is thus an imperfect conception. Indeed it is hardly possible to formulate the idea of one event in time as the cause of another that falls, in time, wholly outside the first. Cause is always taken to be more or less of a complication of relations and circumstances; and these, as acknowledged to bear on one

[1] Cp. Essays in Philosophical Criticism, p. 96 note. Of course if Cause as = sum of conditions is compatible with Mill's plurality of causes, the Cause as sum of conditions cannot = Ground. But it ought to be incompatible; for in any concrete circumstance that may be named as condition, what is not relevant is not condition. So the sum of conditions ought to be restricted to the relevant or minimum conditions.

another, are not mere events in time. It may indeed be retorted that *mere* time is an unreality and that no one ever said that causation was in mere time, i. e. in succession taken as discrete; but that real time involves continuity as well as discreteness, and in such real time causation really is. Such a retort might be ill-founded as a statement of common logical opinion, but would in substance express the principle which I am endeavouring to explain. *Mere* time is mere succession; but real time involves something that is not in succession, though it remains through succession. The consciousness for which there is time has begun a process which tends to abolish time. To say that in this sense Causation is in real time is to say that Cause corresponds to an incomplete ground, i. e. a partially known unity including the factors which are in question as Cause and Effect. But when we come to speak of an incomplete Ground, the difference between thought and reality emerges, for it is only the complete Ground that is the real ground. When the ground in thought is distinguished from the ground in fact, then the cause is one with the ground in fact and is separable from the ground in thought, which latter is sometimes called by analogy the *causa cognoscendi*. Of course the *causa essendi*[1] must be a *causa cognoscendi*, but a *causa cognoscendi* need not be a *causa essendi*. As a matter of fact the ground in thought or *causa cognoscendi* often belongs to the effect in time[2], but may be any element whatever related to the real ground, whether cause, effect, or abstract principle.

[1] Schopenhauer's distinction between the *Causa essendi* (Seynsgrund) and the *Causa fiendi* (Ursache, cause proper) is reduced by the view taken in the text to a distinction of degree. Effect cannot be in succession to cause in the sense of falling outside it; there must be a real whole which includes both.

[2] It is worth remarking as a matter of usage that 'antecedent' in the conditional sentence has absolutely no allusion to the temporal relation of the events connected. Its name may have come from the usual grammatical place of the condition, or from some profounder idea of priority. But this would be a mere historical connection. Mill's application of the term to succession in time creates quite an unfounded idea of correspondence between Causation and the Hypothetical Judgment.

The root of these distinctions is that the nexus of ground and consequence is at this stage still charged with irrelevancy. The cause and effect, ground and consequent, are all of them at this stage concrete events, or groups of incomplete relations, among which the special aspects belonging to any *nexus* that may be in question have not yet been *freed* by analysis. As a result of this state of things the hypothetical judgment which embodies such a connection follows the analogy of singular judgments or of imperfect universals, and has an antecedent which is not affirmed by affirming the consequent, just as the subject of a singular or generic judgment is not affirmed by affirming its predication. And in so far as the hypothetical judgment is taken to be the natural vehicle in which to assert causation, this characteristic of it agrees with the popular view that the same cause always has the same effect, but the same effect need not always be due to the same cause. This doctrine, formulated by Mill under the name of the plurality of causes, and wholly incompatible with his view which treats Cause as 'the sum of the conditions,' is a mere translation into analytic science of the notion of subject and attribute, here quite out of place. The degree of truth which the view possesses depends solely on an imperfection of knowledge and not in any way on the nature of causation.

It is an old story that if, having said that 'All men are mortal,' you then further say that 'A. B. is a man,' you are committed to the assertion that he is also mortal; but if you prefer to make the more cautious assertion that he is mortal, you do not thereby pledge yourself that he is a man. The same maxim in relation to the Hypothetical Judgment is summarised in the formula 'Assert the antecedent or deny the consequent.' It makes no sort of difference in the application of this formula whether cause is antecedent and effect consequent or *vice versa*.

Thus the reason why the law of Causation has been stated in the form 'The same cause always has the same effect' rather than in the complementary form 'The same

effect always has the same cause' is that popular philosophy tends to start from the event which comes first in time, as logical antecedent, because the primary source of knowledge is simply to observe processes in time: and so the further determination of any datum or circumstance *when effected by this elementary method* corresponds to the succession of events in time, and that event which comes first is taken as the datum to be further determined, and that which comes after is regarded as its determination. Of course then the same datum always has the same determination, for every content—and a datum is a content—is an identity, and having attended to an identity in respect of one of its differences we are quite safe in saying that this identity—this datum—will always have the same difference. For if it seems not to have, we may say either that the difference is disguised, or that the datum is not the same. And so we come first to the principle that the same cause always has the same effect; and sometimes, to make quite clear that we are simply regarding a real content in respect of a difference which we have selected out of its concrete nature, we add 'the same cause under the same conditions,' or 'in the same relation;' thereby showing that we know very well that the concrete cause has all sorts of different effects under different conditions and in different relations.

It is usually presupposing the truth of the first principle that we go on to consider whether the same effect always has the same cause; and neglecting in the effect, which we take at first as a goal in which thought can rest, the idea of a limiting reference to a particular antecedent, we are impressed by the variety of relations and conditions compatible with the undetermined result, as contrasted with the single aspect in which we watch the operation of a cause; and we forget that each set of these generates the effect in a slightly different form. It seems so common-sense to say 'If a man is drowned he is dead, but if he is dead he need not therefore have been drowned,' that we forget that, if he is dead *in the particular way produced by drowning*, then he has been

drowned. We might, from the very first consideration of an effect, draw a parallel to the popular form of the Law of Causation, 'Same cause in same relation, same effect,' by a Law of Effect which should affirm, 'Same effect, in same form, same cause.' But, as our first impression in starting from Cause is of the Identity of Effects, so our first impression in starting from Effect, because there is no simple guide to further determination, is of the Plurality of Causes. Really however we have to supplement these ideas by those of the Plurality of Effects and of the Identity of Causes. It is, technically speaking, an accident which of these four points of view attracts our attention first. The knowledge that the same effect has the same Cause is not necessarily later than or dependent on that of the converse maxim. 'If a man is dead his heart has stopped' does not involve a knowledge whether stoppage of the heart must always cause death. Still, as we saw, the common law of Causation is most readily suggested by our experience of simple observation, and has a certain real pre-eminence because of this experience. Experimentally we only follow up Cause into Effect, not Effect into Cause. And thus the natural tendency is to identify Cause with Antecedent, and the common law of Causation 'Same cause has same effect' is the resulting one-sided application to Cause and Effect of the commonplace rules of the Hypothetical Judgment. Of course, when we have both principles together we have more than either alone; but in itself neither *prima facie* involves the other.

We have seen, then, that even the incomplete or partially known Cause can always enter into a Hypothetical Judgment either as Ground or as Consequent. In the same way it is possible for Effect to be either Ground or Consequent in Hypothetical Judgment. But Effect can never be Cause, unless we go back to the doctrine of *complete* Ground in which the boundary between Cause and Effect really melts away. Effect can never be Cause, and yet Effect may be as inevitable, as essential to the sequence, as necessary a Ground of hypothetical nexus as ever Cause

could be. It is a well-known saying that we cannot conceive a storm to have been less violent than it actually was without the difference involving differences in a series of physical processes going back *ad infinitum* in the causal nexus. Yet we cannot bring ourselves to treat the storm as the cause of the previous physical processes which, as we say, resulted in it. The distinction which is at the root of our inability to do so is of course the distinction of Time. The operation of this distinction has never been more trenchantly stated than by Aristotle[1], who lays down the general doctrine of Ground with perfect clearness, but in going on to deal with causation in succession doubts the security of all arguments from cause to a subsequent effect. For 'in the moment between the two, it would be false to say that the second has taken place, although the first has already taken place.' It may of course be rejoined that the cause cannot have completely taken place if the effect has not begun. This rejoinder however depends on the postulated unity of the causal process and on the consequent continuity of time. If we press this point of view, it takes us back to the doctrine of complete ground, which consists in exhibiting the unity or continuity of causation regardless of succession in time. But we are anxious at this moment to do all we can in the way of elucidating the problem involved in the natural conception of causation as sequence, and therefore we will not simply fall back on this notion of complete ground. Granted that time and sequence are continuous, yet they are also discrete. There is indeed no empty μεταξὺ or interval in which we can stand and say, 'The cause is past and the effect is not begun.' But unquestionably we can make a stand at any point in the continuous sequence and say, 'So much is (or 'has been') real, the rest is not yet real.' And what is not yet real cannot be the cause of what is or has been real.

This appears to be the root of our whole conviction about cause and effect in time. Even after the entire sequence has

[1] Anal. Post. ii. 95 a, 30 ff.

been realised, and when all of it is alike real or unreal, as we may choose to count the past, still the objective temporal order into which we project our experiences embodies the succession of relative reality and non-reality which attached to the order in its original constitution. We remember that this became real while that was still unrealised, and we therefore feel that however certainly they may reveal themselves as parts of a single whole, we can never hold the event which came after to be an element in the actual determination of that which went before. It would involve to our minds the absurdity of treating the existent as caused by the non-existent.

I do not mean to deny the reality of this distinction. It amounts to just what it is. Time is a condition, is *the* condition, is we may almost say the inmost nature, of our sensitive experience. The *first* operation of our intellectual synthesis is to build up an ideal objective order which, though itself not in time, yet contrasts as a more or less completed reality with the sensitive experience which is always passing into it. It is obvious that we can only construct our anticipation of reality out of its positive content so far as known to us; and its positive content so far as known to us belongs to the past. We may fill up gaps in the past out of other parts of itself, but we can get nothing out of nothing, and therefore can draw no anticipations from the future. Therefore *at any given* moment we have no choice but to say that the future is conditioned by the past, and the past not by the future; effect by cause, and cause not by effect. Cause, at any such given moment, is what we have, and effect what we have not. And further, taking the past as a representation of all that is, for it is the only positive content that we have to represent anything, we are right in saying that the past as a whole is the cause of the future as a whole. What is, is, and will act as it will act; and what we already know of it is the only source from which we can anticipate its action. But of course the past *as a mere series* of events *is* past; it has ceased to be

real just as truly as the future is not yet real; the relation between two nothings is nothing, and cannot cause anything. The same applies to particular events; it is hard to find words which describe the negative relation of effect to cause, and which do not apply equally to that of cause to effect. Effect cannot be the cause of its cause, for the reason that it is absurd to find the cause of something existent in what does not (yet) exist. But is it less absurd to find the cause of what is now entering upon existence in what does not (any longer) exist? Yet this is what we do if we take cause as an event and effect as a subsequent event. Hence we are driven to the *second* operation of our intellectual synthesis, which is, after erecting an objective temporal order not itself in time, to strip this temporal order of the importance attaching to its successiveness, and to treat it more and more as the expression of a plan or unity. *Except* as the expression of such a unity, causation, as we have seen, disappears; but *as* the expression of such a unity, the causal relation ceases to be in time, because the positive connection between cause and effect being made manifest, the two are united in the complete ground. This must be carefully distinguished from saying that time may be introduced anyhow without making a difference; it does not mean that eggs boil water, or that death produces a revolver-shot. It simply means that the order of succession, which has a largely negative aspect, disappears in the significance of a positive systematic connection, and that we do not in fact, in considering a past sequence, regard what came later in time as less fundamental or elucidatory than what came before.

Then is not Time real? I answer that everything is real, so long as we do not take it for what it is not. Time is real as a condition of the experience of sensitive subjects, but it is not a form which profoundly exhibits the unity of things. And when we transfer the true judgment 'What has not yet happened must be a manifestation of the same unity which is involved

in what I already positively know' to a totality which is already in all its parts equally real, we confuse, and give 'time' a reality which it has not. Such a confusion is involved in the idea that there can be no more in the effect than there was in the temporal cause, and in the tremendous power consequently exercised by historical analysis over common minds. The confusion is reinforced by another aspect of causation. Practice, like sensitive experience, is in time. In translating a plan into practice, the relations of succession hold good. A sequence is what it is, and nothing else; and a reversed sequence would simply be different. Therefore for practice the earlier event is more important, in the sense in which the means is more important than the end. For knowledge of the end does not give power to produce, but knowledge of the means does. But this importance begins and ends with practice, and even there it only exists in virtue of the unity whose nature is expressed *for us* in the fabric of ideal reality—a fabric which is not in time.

Thus it is easy to see the relation between Cause and Ground in the imperfect stage in which they are distinguishable conceptions. Ground is a content which is perceived, by reason of any systematic relation whatever, to involve the determination of another content. Cause is also a Content perceived to involve the determination of another content, and is therefore a kind of Ground, but is primarily confined to the special case in which the determining content is real and the determined content unreal. But as this is merely a negative relation, even the first presumption of causation in some degree supplements it by the postulate of a positive nexus, and we know very well that in practice if no positive nexus, no continued identity of process, can be alleged, we do not allege causation. A familiar illustration is the sequence of day and night. It is generally urged that if causation were mere succession, day must be the cause of night, but that really day is not the cause of night, because both are effects of a common

cause, and either might very well go on without the other. This is one of those trivial examples that seem hardly worth arguing about, and yet, if argued about, must be treated at length. I have shown that I at least think 'Causation = mere constant succession' plainly false and in contradiction with facts; but if I must discuss this case I should like to have the terms defined. The question, as I take it, is, Does 'day' in the sense in which it is here used include a unity, a system, a principle, which is continuous in and responsible for night? If so, day is the cause of night; if not, not. The reason why we think it wrong to call day the cause of night is not because night has the same claim to be called the cause of day. There is no contradiction here. In our ordinary way of treating imperfect causation there is no reason why the daylight hours of Monday should not be the cause of Monday night, Monday night of Tuesday, Tuesday of Tuesday night, and so on. The difficulty does not lie in the sequence being of this alternate nature—a single oscillation of a pendulum is certainly the cause, though not the complete ground, of the next—but *that the persistent unity which lies at the root of both phenomena does not fall within the natural definition of either*. If day meant not merely the presence of light on the earth's surface, but, in relation to any given point on the earth's surface, that portion of the earth's rotation which carried that point from its sunrise to its sunset, then I do not see how it could be denied that this portion of rotation, in as far as it determined the position of the selected point throughout the immediately succeeding section of the rotation, was the cause or principal condition of the ensuing night. But of course the name 'day' is applied e. g. to the six months' day of the poles only by metaphor, being a chronological idea which has become largely independent of the relation of a particular place to the sun's illumination, and having legal and social meanings which do not admit of an antithesis with night. So the true reason why we do not like to predicate causation of

this sequence is simply that, owing to their varied accessory significations, the terms day and night do not apply to successive stages of a continuous natural process, but are mere chance distinctions that are drawn, according to our shifting purposes, on the surface of that process.

But though we do not allege causation where we cannot allege a positive nexus, yet, as I pointed out above, there is a considerable distinction of degree between the objective temporal order and the intelligible unity of things. The less we advance beyond the stage of perception and narrative to that of science and intelligence, the more does the negative distinction of time retain its significance. Strictly speaking, the distinction between cause and effect in time is only real at an arbitrary moment in which we draw an ideal line across the temporal process of sensitive experience, between the real and the unreal. When cause and effect are both absorbed in the past, the distinction is only transferred by memory into the content of reality, which thus takes the form of the objective temporal order. This order would be an intolerable chaos but for a certain presumption of causation, i. e. of unity, which binds it together according to some sort of system; there is no real history apart from the idea of causation. Nevertheless this unity remains for the most part inchoate, i. e. only in some degree explicit; and so, though not itself in time, presents the scheme of a *de facto* evolution in time as a sort of extended memory, with the transferred character of determination of unreal by real, i. e. of effect by cause. Now it is plain from what has been said that the distinction of Cause and Effect is self-destructive. It is utterly impossible to be successful in the investigation of a causal relation without reducing it to the intelligible unity of a complete ground. History therefore, *in the sense of the mere record of remembered fact*, would seem to have for its ideal to disappear into systems of hypothetical judgment, in which complete ground should do duty for cause and effect, and the relation of time should disappear.

This conclusion is true, in my judgment, in relation to the mere phenomena of the past, and the resulting connection between causation and ground. But as regards what we really mean by history, such a conclusion is repugnant to our feelings and inconceivable to our understanding. The reason is plain. History is not merely a name for the recorded past. A series of astronomical observations is not history; it is science, and has no value but for science, unless by chance it throws light on the observer's character or on the state of science in his time as an element in the condition of man. What we mean by History is the revelation of man's nature in action and intelligence. And when we deprecate the reduction of history to a system of hypothetical judgments founded in some single abstract individuality—to a science like abstract mechanics or abstract economics—what we really mean is that man's nature reveals itself in individuals, in actions, in forms of intelligence, and we do not want to lose these realities in abstractions of relativity and necessity. But if we consider that hypothetical necessary or relative judgment is entirely based upon categorical judgments, that all nexus is within an individuality, we shall see that history may be received into the intelligible unity of knowledge without sacrificing its concrete import and characteristic significance. This could only be destroyed if we insisted on predetermining within *what* whole or system we should find the facts of history to be necessarily related.

And no doubt a suspicion of some such prejudice is operative in the reluctance to absorb history in 'science' to which I have adverted. If science meant exclusively the sciences which grow out of the one-sided forms of measurement, then we should rightly deny that there is a science of history, and, for the same reasons, that there is a science of art, of political form, or of religion. We escape however from such suspicions if we remember that all connection is based on fact, and all analysis on individuality; and that the nature of the facts or of the individual whole or system with which

a science deals can *ex hypothesi* be only for that science itself to determine.

Thus the conception of Cause as an event in time anterior to effect gives way on analysis, and forces us back to the conception of the complete Ground; and the conception of incomplete Ground (*causa cognoscendi*) as distinct from Cause, expands into the same unity, which, as we saw, is at once the complete Cause and the real Ground; i. e. the relation of part to part within an actual and systematic totality. This relation of part to part, either burdened with irrelevancy as in the ordinary hypothetical judgment, or pure and relevant as in the hypothetical judgment whose terms are reciprocal, forms the content of the abstract universal judgment. And this abstract judgment is a divergence from the concrete evolution of thought, and joins with the mediate and quasi-generic judgments of the sciences which arise out of one-sided measurement[1]. But it may also be regarded as an element in or aspect of the popular or transitional quasi-collective and the generic judgments which are enumerative or individual in form but analogical in meaning. Analogy, as we pointed out, is compatible with systematic necessary relation.

On the other hand, though a complementary aspect of the universal judgment, the pure hypothetical is destitute of finality, and incapable of standing alone. It demands a reversion to concrete thought by the fact that it presupposes a self-existent whole. Apart from such reversion it may become a wholly arbitrary and meaningless play of fancy, presupposing conditions which are not made explicit.

As I have not yet dealt with negation, I shall leave the negative forms of the hypothetical judgment to be dealt with in the same chapter as the disjunctive judgment, with which they are closely connected.

Supposition in universal judgment.

c. The above appears to me to be a fair account of the hypothetical or abstract universal judgment considered from a strictly logical point of view. In one important

[1] See Scheme, p. 92.

respect however it is *prima facie* at variance with conclusions which might be drawn from the grammatical shape of these predications as to the attitude of mind in which they are normally made. The point in doubt is the existential significance of the universal judgment. The account which I have given treats the existential implication which attaches—undoubtedly in very various degrees—to the different forms of the universal judgment, as cognate with the existential affirmation involved in the singular and in the perceptive judgments. But it has been trenchantly laid down by Mr. Bradley that a different view is suggested by the attitude of the mind in all purely abstract judging—abstract be it remembered not necessarily in content, but only as all thought is abstract when contrasted with sense-perception. I am unable to reconcile this view with the existential value of judgments about individuals designated by proper names, in which there is no direct reference to sense-perception nor to anything but a content, whose real existence is as I imagine taken to be asserted owing to its concrete nature. But I proceed at once to discuss the analysis of the abstract universal affirmation, from the point of view to which I allude.

It will be remembered that in the general discussion of the nature of judgment, we agreed that the ultimate subject in judgment was never an idea,—never that is to say even a logical idea or content, for the particular psychical image we found not to concern us in logic. The ultimate subject in judging was always, we held, the Real, which in the act of judgment is qualified by certain logical ideas. So long as the immediate subject was present perception, whether additionally qualified by designative ideas or not, all went smoothly, for the immediate subject was then simply the point of contact with the ultimate subject of judgment. Some difficulty, indeed, arose in explaining the real reference of the Singular judgment in which the subject may fall outside present perception and may have to be united therewith by a constructive process. Still, however, the immediate sub-

ject was a determinate element in the whole of Reality, having individual existence manifested within the sensible series, although e.g. in the case of an organism, still more in the case of a man, not of a kind that could really be presented by sense-perception as such. So far therefore we were, in judging, referring an ideal content to reality in some particular concrete aspect, and therefore our Judgment was still plainly existential, i.e. such as to become false if the concrete element of reality described had no place in the series of sensible events.

Now when we come to deal with the Universal Judgment it must be admitted that *at least* as a question of form the reference to reality becomes less easy to define. The pseudo-collective and the analogical judgment at any rate (dismissing the conception of the individual generic judgment, in which the singular judgment revives) are unquestionably capable of an interpretation which reduces them to the pure Hypothetical Judgment. In our old acquaintance 'All men are mortal' the 'all' is too obviously *not* collective to stand in the way for a moment. We certainly might be driven to confess that in so judging we had only asserted 'If man, then mortal' or 'Where man, there mortal.' Such an interpretation is involved no less in Mill's analysis of the import of propositions than in Lotze's or Bradley's treatment of the universal judgment. To affirm co-existence of attributes is not to affirm existence of subjects[1]. The analogical judgment has this aspect even more plainly. 'An organism as such is mortal' means, it may be urged, if taken strictly and without counting implications, 'If organism, then mortal,' 'Where organism, there mortal,' 'Whatever is organic is mortal.' If in consequence of such an assertion we take it that organisms are actual elements of the real world, this is implication—though very strong implication—and not assertion.

[1] This comes out very emphatically in Mill's account of Definition, which when Real at all, he analyses into a meaning *and* a postulate of existence. In this he is pretty much at one with Mr. Bradley's account of universal judgment. See also Mill's account of mathematical truth.

According to this analysis, the essence of which is to regard the implication of existence in these judgments as outside the matter affirmed, all abstract affirmation—abstract merely in the sense of not referring to present perception or to particular sensible events—is on the level of hypothesis, has for its immediate subject an idea not a reality, and consequently has no existential import, or 'deals purely with adjectivals[1].'

The identification of the universal judgment as such with affirmation based on hypothesis being thus made, the further development of the view turns on the nature of hypothesis or supposition. The essence of supposition is that it is *qua* supposition, wholly arbitrary in its starting-point. Its content is taken, not given, is an idea, not a fact (if *per accidens* a fact, is not used as a fact, i. e. its existence is not argued from), and is considered not in itself, but for the sake of its relativity, i. e. for what flows from it, for its consequences. The essence of supposition is in short argument from content, and not from existence of content. The consideration of any proposed legislation, e. g. a Reform or Land Act, with reference to its consequences, is an example of supposition. 'Suppose every adult male to have a vote, it will be impossible to maintain indirect taxation;' 'Suppose Ireland to have a Statutory Parliament, the Imperial Parliament will by this fact itself become statutory.' Or again, 'Suppose beings endowed with perception but confined to a plane in the exercise of it, they must see all figures as lines or points.'

The process is to select or to fabricate, apparently at pleasure, an ideal content, to think of it as in connection with some known reality, and to judge the result as a truth conditional on such connection.

It is plain that in this operation, subject to a certain reservation to be mentioned directly, the supposition selection or fabrication[2] of content is arbitrary, but the judgment proper is necessary.

[1] Bradley's Principles of Logic, p. 81.

[2] Selection and fabrication differ only in degree, not merely because all

What then, precisely, it has further been asked, is in such a case affirmed about ultimate Reality? Plainly, *not* the existence of the content as a fact in the context of our world. We may take Sigwart's instance, reproduced by Bradley. 'Si tacuisses, philosophus mansisses.' Something is here affirmed, but not the actuality of the content, which is by the strongest implication denied. Or again, 'All trespassers will be prosecuted.' The truth of this declaration does not depend on there being trespassers, though it cannot be tested unless there are trespassers.

When we have once accepted this point of view, and excluded as unessential the various implications of existence which attach to various Universal Judgments, the conclusion is inevitable. Judgments so regarded do not affirm as true of Reality any explicit content or even any connection of explicit content. We have seen that it is no impeachment of the judgment that its content never has been nor can be actual. 'The necessary may be impossible or non-existent[1].' And as for the *connection* of content, though it is necessary, yet it cannot be actual unless the content to be connected is actual, and the judgment may be true though the content be incapable of actuality. Therefore the truth of the judgment, according to this extreme analysis, depends neither on the actuality of its content, nor on the actuality of the connection it alleges within its content. What then does such a judgment assert of that Real which is the ultimate subject in every judgment? Simply this, that the Real *is such* that under the ideal condition which forms the immediate subject of the judgment it will furnish the ideal consequent which is expressed in its predication. The hypothetical judgment would then be *illustrative* but not *enunciative* of Reality. The property of Reality which it illustrates may however be accessible to knowledge; or again, according to the view before us, it may not. Simple examples of the former case

fabrication is selection, but also because all selection is fabrication—involves the constitution of an idea from a given or chosen point of view.

[1] Bradley's Principles of Logic, p. 186.

form the best explanation of the conception which we are discussing. 'If you ask him for money he will refuse you.' The real quality of the real man, on which this prediction rests, may be that he is a miser; then his miserliness x is the real fact, *not apparent in the judgment*, which the supposition and consequent a and b only illustrate by its effect in an ideal case; and which is categorically affirmed, but only as an unknown x, in the Judgment. And it is conceivable that the property of Reality which lies at the root of the judgment may not be known, and wherever the connection envisaged as hypothetical is considered to be ultimate and not susceptible of further explanation, the property of Reality at its root *is* pro tanto unknown. Such a connection would be, I suppose, 'Whatever is material, has gravity.' The property x of reality which is here categorically asserted as the basis of this connection, 'If a then b,' is, I presume, and is likely to remain, unknown.

The real criticism which I have to offer upon this view is contained in the whole account of judgment which has been submitted to the reader. Its point and purpose have been to exhibit the aspects of fact, and of relativity or necessity, within the judging function as complementary and inseparable, but as differently predominant in dealing with different contents. Consequently, the abstractness on which their respective predominance has hinged, has been treated as the abstractness of contents, and not as that formal abstractness which is merely the mark of thought as opposed to sensuous perception. And the result has been to exhibit the graduated existential implication of universal judgment as falling within and not without the import of those judgments, and as homologous with the aspect of existential affirmation in perception and in historical narrative. But I propose to comment very briefly on two special problems raised by the view before us.

Simple and conditional Judgments.

(1) It is easy for any one to form for himself a *catena* of universal judgments, beginning where the proper name

becomes significant, as with Europeans, Christians, Peelites, and passing on through the generic conceptions of classificatory sciences, to physical and mechanical principles, geometrical axioms or theorems, and finally to imaginary and impossible but self-coherent hypotheses, like that embodied in the ingenious *jeu d'esprit* entitled 'Flatland.' Such a *catena* is at the root of the view of Universal Judgment which I have endeavoured to formulate. Any one who will take the trouble to follow up and to fill out with instances familiar to himself the terms of such a series, will hardly be able, I think, to avoid forming the conviction that no single type of proposition is adequate in the same degree to the content of all universal affirmations. If, however, we are compelled to choose, the conditional proposition is the more adequate. But it is not adequate. Such a judgment as 'All Christians hold that God is a Spirit' combines collective and generic meaning with necessity. It indicates not merely that the doctrine is of the essence of Christianity, i.e. that 'If a man is a Christian he holds' etc., but that there is *a* Christian world, realised in *many* individuals, which is united in this conviction.

And on the other hand, after our too laborious consideration of the subject, it is not necessary to remind the reader that relativity is operative within the judgment from the moment of the first analysis introduced by perception into the data of sense; that is to say, even when the judgment assumes the external form of the impersonal proposition, which indicates that identifiable subjects are not yet constituted in virtue of determinate qualifications.

The fact then is this. Speech can express no logical relation except by making it the correlative of a word or clause. But the common types of speech, which have been made the basis of logical investigation, are direct and simple. They therefore embody only one aspect of the concrete logical thought, and leave all others to be guessed

at from variety of context and the requirements of content. The process of recognising explicit linguistic correlatives of relations which in these direct forms are only implicit is a slow process—Aristotle did not recognise the conditional proposition on its merits—and begins, as is usual in such cases, by substituting one-sided abstraction for unanalysed confusion. Therefore by adopting either the direct or the conditional mode of expression we ignore in the first case, and formally exclude in the second, elements without which it is impossible for judgment to exist. The direct or 'categorical' form is used till it breaks down under the burden of an import for which it was not invented; and the conditional form then takes its place, to express the relative import, the determinate and restricted reference from part to part within a whole, which now insists on making itself predominant. But both forms, not one only, are inadequate to their content. The content of categorical assertion has relativity, and that of hypothetical assertion has absoluteness. But categorical assertion (I am speaking of grammatical form) leaves the former, and hypothetical assertion leaves the latter to be implied. The two forms however have not an equal right to the ground they commonly claim. The first comer has, naturally, occupied all it could get, and more than it could adequately deal with. It is against this encroachment of the categorical judgment-form that modern logicians have rightly espoused the cause of the hypothetical. The true frontier is, beyond a doubt, where the singular judgment ends. After that point, if we dismiss the Individual Universal and omit to consider the Disjunctive, the purpose of assertion is relativity or sequence, and absoluteness or existence is only its presupposition. Formal Logic granted this territory, that of the pseudo-collective and the analogical judgment, to the Categorical *Judgment*, simply because it found the Categorical or direct *Proposition* in possession.

And the further analysis of the irrelevant connections which encumber every perceptive and singular judgment,

and which, if understood to be *generally* affirmed, immediately become false, may be regarded as a reprisal on behalf of the hypothetical judgment, which, now that attention has been drawn to the meaning made explicit in the conditional sentence, threatens to dislodge the categorical judgment even from the fields of perception and of history. The degree in which such a claim should be conceded has been indicated above.

Thus the simple and the conditional[1] propositions are, the one of them an indeterminate and the other a one-sided type — both therefore imperfect expressions of thought. The latter is borrowed no doubt from, or is at any rate most appropriate to, the extreme and arbitrary attitude of mind known as supposition. It is natural, as we have seen, that the empire of the first comer should not be broken into unless a forcible demand arose for something utterly incompatible with its type. The representation which is correlative to supposition is thus the sole representation in ordinary speech of the aspect of necessary sequence within the judgment. This is why, when logic awakens to this aspect, it is tempted to find its essence in supposition.

But supposition is not the essence. Supposition is intentional abstraction or selection culminating in fabrication; and the essence of the judgment is not in the fact of intention, but in the logical ground and justification of the intention. The interference of the will is no *differentia* in a logical process. All thinking presupposes will, but the *guide* of thought can never be moral purpose, the purpose of will, but must always be logical necessity. What remains then out of the fact of supposition is that a content is taken, chosen, fabricated, if we will, with a view to its relative aspect, to its consequences. But what is

[1] The grammatical difference between the two is connected with their logical import in that the conditional sentence provides for an express analysis *ad hoc* of the subject-qualification of Reality, whereas the direct sentence simply indicates a subject-content by a name. If we insist on the name being the *right* subject name in the context, as in Aristotle's *καθόλου*, we have an intermediate stage.

presupposed in so taking it, and what are the conditions under which alone it can be so taken—whether, that is, it can be taken in the air and without either self-relation or relation to an actual system, are questions in no way touched by the mind's attitude in supposition. We shall see that speech finds the embodiment of a necessity resting on fact in the proposition which expresses the disjunctive judgment.

The basis of Hypothetical Judgment.

(2) The quality x of Reality on which the sequence 'if a then b' depends may be, and is in ultimate sequences so far as ultimate, unknown. This follows from the reduction of the abstract or universal judgment to judgment based on supposition. But it follows from our analysis of the hypothetical judgment that if this were so, the back of the sequence would be broken. The *ground* would be absent. Every hypothetical judgment is affirmed only within an actual system. What then are we to do with our ultimate sequence, e.g. with the nexus between resistance and gravity? I cannot but maintain that, *if* we have no explicit ground to go upon, we must either surrender the sequence altogether, or affirm it categorically, i.e. not *as* a sequence, but as a datum; not as a coherence, but as a conjunction. 'All matter (i.e. all that resists) gravitates' is no doubt a judgment in which we look for necessity. But it does not follow that we find it. It presupposes the judgment 'There is gravitating matter.' It is not adequately rendered by 'If or wherever there is matter it gravitates.' We are unable (or at least I am unable, which is all that my illustration requires) to assign any system which acts as ground and compels the sequence to be true within it. The world of matter given as resisting and gravitating, as a systematic fact, *is* the ground. And therefore it *is* on the other hand a true hypothetical judgment to say, 'If a material object is set free within range of a gravitating centre, it falls with a velocity accelerating as the squares of the times.' For the content of this judgment is *within* the system of

gravitating bodies, and the sequence is compelled by that system, whose existence as a fact is required by the judgment, but not in this form explicitly asserted. In this case the unity of gravitating matter is the x on which the sequence a–b is founded.

May not the whole system be supposed, ground and all? *Certainly not*; and this is the fundamental point at stake. Every judgment is a qualification of reality by some ideal content, and when the basis of a sequence is the content by which reality is qualified, that basis is by the judgment affirmed to be actual. So far Mr. Bradley and I are together; my further contention is that this ground or basis must be known, and must be indicated in the judgment, of which it forms the essence. The degrees in which it is so indicated form the various complete and incomplete grounds which were discussed above. But an ultimate ground must be actual; it is the fact which is judged in a hypothetical judgment. We may of course freely suppose or imagine *a* system, as complex as we please; but if we proceed to *judge* about the consequences or results of such a system, it must thus be related to these consequences within some further system; and this further system must be actual. In other words, you can only suppose an antecedent, you cannot suppose a consequent; the consequent must be judged, not supposed; and in judging the consequent you assert the underlying ground to be actual.

This may be illustrated by the extreme cases in which we refuse to entertain a supposition. This means that we are not aware of any reality which furnishes a system such that the supposed case is capable of entering into it. When supposition begins to infect the nature of the reality, we are beginning to suppose and not to judge our sequence. It is quite doubtful whether the conclusions of 'Flatland' can be taken as true even *qua* hypothetical judgments. When your supposition has knocked the keystone out of actual reality, how is it to support a conclusion?

The application of this conception would I think solve the curious cases in which a sequence is true, though it is possible for the content of supposition not to exist, or even impossible for it to exist. What must exist is a system that, subject to the supposition, necessitates the consequence drawn from the supposition. Whether the content itself exists or not depends upon whether it is an element essential to the system; and how it exists, on the nature and self-completeness of the system. The former condition meets the case of impossible contents, which are in every case illegitimate suppositions—i.e. suppositions in which the consequent has to be supposed and not genuinely judged, because the supposed antecedent conflicts with the nature of the real system on the basis of which alone any conclusion about it can be drawn.

I will take some examples. 'Given a first cause, we can dispense with the idea of a regress to infinity.' But Cause, in any sense which it could be First, i.e. in temporal relation, means an element in a system of relativity. Therefore the idea of a first cause contradicts the whole actual system to which the idea of Cause refers, and it is utterly impossible to affirm anything about an idea which begins by destroying its own basis of affirmation—the causal system. Or again: 'If one man were throughout the whole period of his conscious life alone in the universe, his moral purpose could be nothing but to please himself.' Here we are judging on the basis of an existing moral world—for it is only this that gives a meaning to a judgment relating to moral purpose—but we are putting a case which contradicts the nature of man as a being existent in a moral world. I do not think that in this case any judgment can reasonably be made. But the purposes of supposition in argument are so various, for its object may be in different degrees to emphasise the impossibility of the content supposed, that the limits of legitimate supposal are exceedingly hard to define. Undoubtedly its use is one of the most fallacious if one of the most effective means of

controversy. 'If A. B. were to turn coward'—'But he could not'—'But I am only putting a case'—'But if you put such a case I may put any consequence I choose as equally likely,' i.e. it is felt that the real basis on which judgment rests is annihilated.

This real basis can never be dispensed with in judgment. The nearest approach to dispensing with it is made when elements of reality which would conflict with the suggested case are wilfully kept out of account by an act of abstraction; which act of abstraction may be either borne in mind, or forgotten. If the act of abstraction is borne in mind, we obtain such judgments as those in which mathematical science deals with imaginary quantities[1]. Thus judgments are subject to the reservation implied in the abstraction from reality which enables them to be made. Yet, in as far as they are judged at all, they must rest upon, and involve the affirmation of, properties of reality. If the abstraction is forgotten, we then obtain such judgments as apply imaginary conceptions without reservation to the real world; 'A conjuror can tie a knot in a string whose ends are held, because he understands the properties of four-dimensional space.'

I may further illustrate this last case by the example of artistic fiction, which I have discussed at length elsewhere. It consists of judgments both singular and universal[2], made on the basis of human nature, but subject to a reservation which separates them from the world of

[1] See p. 174 ff. on mathematical infinity.

[2] It may be doubted how far the universal judgments in a fiction ought to partake of the character of fiction. It depends on their grade of universality. Judgments of a reflective order, about human nature for instance, if not dramatic, are expected to be true without reserve. Judgments about parties, nations, etc. may be fictitious. Dramatic sayings are yet more complicated; they are not judgments of the author at all; the author's (fictitious) judgment is that they were uttered. Then their value or merit is compounded of their truth as estimated by the limited reality of the drama in which they occur (i.e. their appropriateness) and of their truth as estimated by real reality, i.e. their weight or depth, which of course involves the whole relation of the piece to real reality. Vid. Knowledge and Reality, p. 140 ff.

past sensible events. While actually under the spell of romance or of the drama, we forget or half forget this reservation; but we do not and cannot forget the true and ultimate basis of the judgments, fundamental human nature, which is the ground and substance of the whole matter.

But we raised a question not only whether the content exists, but *how* the content exists. This depends, we said, on the nature and self-completeness of the system within which it exists. Many universal judgments deal with sensible events, which are not, within our knowledge, contained in any really concrete whole in time and space. For these, according to the principle which we have followed throughout, the abstract universal or hypothetical judgment postulates such existence as they can have, according to their nature and that of the incomplete system to which they belong. There is nothing which cannot ultimately be taken up into some individuality by constructive thought. But as in ordinary judgment no such actual construction is operative, we have to substitute for it the mere assertion of the basis to which the sensible occurrence in question is known to have some relation. The imperfect explicitness of this relation is the note of distinction between the hypothetical and the disjunctive judgment. 'Pure red is ethereal undulation impinging on a normal eye with x vibrations to the second.' Here the ground or basis of affirmation is the existence of light, which is ultimately dependent on the existence of sentient organisms in a certain relation to the material world. Now this relation, though not known nor explicit in the judgment, must be taken as knowable and real. Space and Time indeed produce the illusion of endlessness; but no special positive content like sentience or light is involved in this illusion; we rather assume every positive content to have its own time, place and conditions within our actual individual system. No doubt we may be asked, Does the above hypothetical judgment assert the existence

of red, or not? And can we claim to assert the reality of what is *for us* an indeterminate endless series which as a whole cannot be real? To these questions I should propose to reply: 'The hypothetical judgment in question asserts the existence of light as the categorical basis of the nexus which it selects. The existence of red light is involved in the existence of normal light-stimuli and normal eyes. Therefore the judgment in question asserts the existence of red light as a feature of the reality constructed by and for us, and subject to the reservations which its position in that reality imposes on it. We do not claim to assert the reality of an endless series of sensations as such; but in the first place a positive series as referred to an actual system is already placed beyond theoretical endlessness, and in the second place it is not as an occurrence in the way of sensation that we assert its reality, but as an attribute of things in the whole of consciousness, which, as constructed out of perception, is *for us* the only reality.' This is in effect the answer which was given above to the question whether the conceptions of geometry were judged to be real; and it follows inevitably from the considerations to which we were led in treating of the doctrine of Ground. We shall see that the real Ground, when made explicit, takes us into the province of the disjunctive judgment. The element of categorical assertion in the hypothetical judgment, consisting as it does in some underlying real attribute, also presents a close analogy to the positive basis of negation, as will appear in the following chapter.

CHAPTER VII.

NEGATION, OPPOSITION, AND CONVERSION.

Negation and Affirmation.

1. THE Negative Judgment presents at first sight a paradoxical aspect. We are bound to take it, *qua* judgment, as playing some part in knowledge, and as at any rate capable of contributing some factor to the ideal fabric of reality. But it assumes the external shape of ignorance, or at least of failure, and the paradox consists in this—that in negation the work of positive knowledge appears to be performed by ignorance. The contradiction arises, as we have seen other contradictions arise, from the adoption by thought of a shape which at best expresses it but partially, and the retention of that shape when the aspect which it did express has come to be dwarfed by other aspects of knowledge. But of course the shape could neither be adopted nor retained did it not in some prominent aspect coincide with the requirements even of developed thought. Here then, as elsewhere, the key to our problem must be looked for in the conception of the individual mind working out its participation in reality by help of forms never wholly alien to this aim, but profoundly transmuted in proportion as it is attained.

Negation is at first sight merely negative. It appears to say nothing, but only to deny, i. e. to put away some ideal content as other than reality or to express our inability to recognise it as belonging to reality. The first step then towards ascertaining its import is to ask, *what* does it deny or pronounce unreal? what does it presuppose to be present before denial is possible?

It certainly does not presuppose an affirmation. Both fact and theory protest against such a view. We have not always judged a matter to be true before we deny it. And

if an affirmation[1] of the same content is to subsist as a condition of the negation, it seems doubtful whether a negation would not always have to be self-contradictory. Although Sigwart's account of double negation rests on this view, yet he more cautiously says elsewhere[2] that it is an *attempted* affirmation ('Den Versuch einer Bejahung') against which negation is directed. And this seems so far to agree with experience. What is the nature of this attempted affirmation? 'Suggestion' and 'question' come into the mind as possible equivalents for it. It is difficult however to find a special significance for either the one or the other on purely logical ground. A question is closely related to a command, and has its differentia in being addressed to the will of another person. It is impossible in good faith to ask a question of oneself. The power of the metaphor by which men are said to question themselves rests on treating oneself as another person. A question is a demand to the will to reveal something known to the person whose will is appealed to; but if I know the answer, I need not ask myself; if I do not, I cannot ask myself.

A question then as such has not a logical differentia, and cannot be the logical presupposition of negative judgment. Still it may contain what we want. It is not merely an ideal content floating before the imagination, even if we were to grant that there are such floating ideas. It is an idea in some way tested by Reality. A suggestion seems to be the same. It is not a floating content; it is suggested *as* something, as, so to speak, a candidate for a place in a judgment already framed. That is to say, a question or suggestion as it is on logical ground, omitting any demand upon or incitement to another will, amounts at least to an idea whose content is Reality qualified in a certain way. Is this all? This would not suffice to explain the import of

[1] Sigwart distinguishes 'affirmation,' as the conscious opposite of negation, from 'Positive' judgment, as assertion without consciousness of possible negation. We shall see in the sequel the value of this distinction, which can only be taken as one of degree.

[2] Logik, vol. i. p. 120.

suggestion followed by affirmation or denial. It would not explain the significance of the decision even when negative. There is something more, and it is this. The content of the suggestion is taken within a whole in which we have an *interest* and which *is* referred to actual Reality. Every suggestion enters into a rudimentary disjunction. I mean by *rudimentary* disjunction an alternative whose limits are not made explicit. Where there is a question or suggestion, there is always a something—some general predicate—known to be true with reference to the matter before the mind, and an interest which we have in that something. It is within this something that the attempt to state it more precisely, the question or suggestion, falls. It is hazardous to obtrude analysis on the simpler stages of consciousness; but I do not see how we can have a suggestion followed by denial cheaper than this. We might even fall back on the principle which has been laid down in previous discussions, that any consciousness for which a continuous real world exists, sustains that world by a judgment. When a man first doubts and then decides, on such a question as whether the river which he sees before him is safe to ford, however simple the mental process may be, there must be in some form a positive basis of the two or more alternatives as well as one suggested alternative. He must start with the fact that the river has depth, or current, which he must deal with in crossing, and within this fact the doubt 'too deep?' 'too swift?' has its meaning for him. In simple cases this embracing judgment of fact is hardly traceable *except through the interest in the question.* This interest, if looked at closely, betrays the nature of the alternative which the question involves. 'Too deep?' 'What then?' 'I cannot get home to-night,' i. e. the general fact is that the river is between me and home.

Negation then presupposes an idea *suggested* as true of Reality within a state of facts *judged to be* true of Reality and interesting to us in respect of the matter suggested; or in other words, an alternative judged to be true of Reality,

but only so judged as one among a set of alternatives, and therefore, in itself alone, *problematically* judged true of reality—judged as a possibility, as one among a number of alternatives, or as subject to unexpressed conditions.

We are now able to decide the disputed question whether Affirmation is prior to Negation, or whether they are co-ordinate types of Judgment. Negation is not, as such, the denial of affirmative Judgment, and therefore does not presuppose the affirmation of that which is denied. So far, affirmation is not essentially prior to negation. On the other hand, Negation does presuppose some affirmation, that is the affirmation of a state of facts which, being judged true as a whole, carries with it the problematic affirmation, the affirmation as a possibility or enunciation as a conception in the world of meanings, of the idea 'suggested.' In this respect, therefore, affirmation is in the beginnings of knowledge, at any rate, prior[1] to Negation. The world must have positive content judged to be real as a condition of anything following from the removal of a positive suggestion. But I cannot believe that the consciousness of a positive world could in fact exist for an appreciable time without the development of negation[2]. Further, however, it is also true that in the beginnings of knowledge negation is a degree more remote from reality than is affirmation[3]; and this character of ideality clings to the negative form through its whole development, though without debarring it from the acquisition of objective value. The remoteness consists in this, that the suggestion which denial presupposes is, as we saw, not a mere floating content, but a suggested qualification of reality, in short 'a suggested affirmative relation[4].' An affirmation can be, comparatively speaking, given as fact; a negation cannot, except in quite another sense, be given. It has to be made, and made by setting an ideal reality over against

[1] In this sense it may be called, if we prefer to do so, 'positive' judgment.

[2] See above, Introduction, p. 24, on the *formal* implication of distinction in objectification.

[3] Cp. Bradley's Principles of Logic, p. 116.

[4] See Bradley, ib.

real reality and finding them incongruous. 'That fire is still burning' involves no doubt intellectual selection and is so far ideal, but 'that fire is not out' is one remove more ideal, because it has to bring up the idea of 'that fire being out' and test it by the perceived reality, and then only proceed to judge its exclusion to be a fact. We must not however exaggerate this difference. Affirmation itself, or even positive Judgment, cannot take place until the distinction between a mere idea and a fact of reality is recognised. And with this distinction the idea of negation *is* given. It might therefore be argued that Judgment, not to speak of affirmation, presupposes the idea of a negative relation [1]; just as negation presupposes that of an affirmative relation. The fact seems to be that affirmation presupposes the idea of negative relation in general, while negation presupposes *the idea of* [2] a corresponding affirmative relation in particular. This applies to the beginnings of knowledge. In complete thought we shall find the two more on a level.

Thus it is true, especially in the beginnings of knowledge, that Affirmation is prior to Negation, both as one remove nearer to reality, and as supplying the reality within which alone Negation has a meaning. But it is no less true that Negation has from the first its essential place in knowledge; and as Reality becomes for us an articulated system, the value of negation approaches more and more nearly to that of affirmation, with which it finally becomes equivalent. This is however not to be understood in the sense that the import of negation disappears from knowledge; but in the sense that affirmation and negation alike become double-edged, each involving the other.

Bare denial and Infinite Judgment.

2. Negation then, in its primary shape, is the exclusion of a suggested qualification of reality. The bare expression

[1] Cp. Bradley, Principles of Logic, pp. 2, 110. I find some difficulty in reconciling these two passages.

[2] Not 'presupposes a corresponding affirmative relation as judged true.' That view we have rejected.

of this import, reduced to its minimum, would be found in what has been called by a mis-translation of Aristotle, the infinite judgment.

The infinite judgment was a term applied by Kant (following, I presume, the tradition of formal logic) to judgments which had for their predicate what Aristotle called an 'indefinite' or 'undistinguished' name or predication[1]; i.e. such a phrase as 'not-man,' 'not-good,' or the like. More important however than Aristotle's expression 'indefinite name' was his distinct verdict that such phrases were not names or predications. He gave them the title of indefinite or undistinguished names or predications, 'because they may be truly predicated of everything alike, whether existent or non-existent[2].' It is plain that Aristotle's verdict is right, and that such names have no signification. They are 'undistinguished' because they are undistinguishing. It may therefore be observed in passing that to attempt to read all negation as affirmation of a negative name is an unmeaning device, though possibly guided by a feeling of a true ideal, viz. that negation, if it is to have a positive import, must involve an affirmative element. Only by this contrivance the affirmative element is ludicrously absent. We should be, as Mr. Bradley says, denying, and then affirming that we have denied.

It is for this reason that the 'Infinite judgment' may be fairly represented by examples in which the denial, though undeniable, is unmeaning. 'Virtue is not square,' 'The soul is not red,' 'Man is not a stone.' These, *qua* negative, are fully on a level with 'A monkey is not-man,' 'A stone is not-Christian.' And so in illustrating the import of negation we may disregard the pseudo-affirmative character of the latter instances. Our interest in them is that, if strictly interpreted, they display to us the

[1] *ῥῆμα* or *ὄνομα ἀόριστον*.

[2] Ar. Περὶ Ἑρμ. 2. 3. Though the reading is doubtful in the application of these words to *οὐκ ὄνομα*, it is enough for our purpose that they are applied to *οὐ ῥῆμα*.

nullity of bare denial. 'Not-Christian' literally interpreted includes not only heathen humanity, but the fixed stars, the sea, and indeed, in Aristotle's words, 'everything whether existent or non-existent' except Christians. It refers to no one sphere in preference to another, and thus says nothing definite enough to be intelligible. The point being once established that negation *qua* negation has no significance, we may disregard the attempt to erect it into affirmation which draws our attention to this fact. And we may then safely take as instances of the infinite judgment, so far as its import is concerned, the judgments typified by 'Virtue is not square.' These show the true type of bare denial, for they are the only negative propositions in which usage does not irresistibly limit the sphere of the negation. And when the sphere is limited, the denial is no longer bare.

Thus it appears that bare denial, whether disguised as spurious affirmation, or taken as the mere exclusion of mere suggested predicates, amounts in the strict sense to nothing. The judgments by which it is typified are the exact counterpart of absolute tautology, and like such tautology, are not really judgments at all. Identity and difference are inseparable aspects of all that exists or can be thought; but in these two classes of would-be judgments identity and difference fall apart, and thereby the conditions of intelligible judgment are destroyed. Pure tautology aims at mere identity, and bare negation at mere difference. It will be found that any meaning which in practice we attach to an apparent tautology or an apparent bare negation is owing to the introduction of difference into the former, or of identity into the latter. 'Business is business' qualifies a certain class of affairs by the principles on which they ought to be conducted; 'The soul is not a machine' qualifies the soul, not by the mere exclusion of mechanical properties in favour perhaps of absolute nothingness, but by some positive characteristic of the soul which is incompatible with its being a machine.

Significant Denial.

3. We have seen that denial was not to be made into affirmation by the rough and ready method of the Infinite Judgment. But we started, on the other hand, from the postulate that denial, as a form of judgment, must be capable of contributing something positive to knowledge. Whether positive necessarily = affirmative is a problem that will solve itself as we come to understand the full nature of negation. I use it here simply as antithetical to 'nothing,' or as an emphatic reiteration of 'something.' We must assume with Plato that knowledge is the knowledge of something; and if the nature of 'nothing,' as e.g. the abstraction of empty thinking, can be known, then nothing is so far and in that sense something.

All significance then is in this sense *positive* significance, and significant negation must therefore convey something positive. What is it that it does convey? We shall find the answer if we look at that which all judgment has in common, viz. the *interest* or *bearing* of the judgment. What is it that we really mean or wish to predicate when we make an ordinary negative judgment? There is always, I may observe, something unreal in the analysis of isolated propositions. Apart from the context of a book or of a conversation, or from the precise standards which involve the fixed context of science, our interpretation of propositions into judgments is almost entirely arbitrary. On the other hand, it may be said that in a given context the 'bearing' which we ascribe to a proposition is not strictly within the limits of what the proposition enunciates, but is read by us into its meaning. It may be doubted however whether in actual living thought there is any judgment that is not an enthymeme, i.e. an argument with a suppressed premise or a suppressed conclusion. If we attempt to prune away from the judgment all the implied and suggested bearings of the proposition which conveys it, we shall find that we have whittled away the meaning which is the judgment itself. We must never forget the conclusion which we reached above, that the unity of the judgment does not exclude

systematic multiplicity within it. The logical content employed in any given judgment is a many-sided although determinate idea, and is gripped and attached to its actual place in the logical mechanism now by some of its prominences and now by others. Some reservations will have to be made in this respect when we come to speak of judgments that deal with self-contained systems, a type which we have more or less anticipated in the individual and generic judgments. But in ordinary reflective judging we are constantly referred away and away along a series of grounds and consequences, and it is idle to attempt to reduce the judgment to simplicity. What we really *mean to mean* is only to be found in the explicit articulation of the whole system of fact which the interest of the moment covers; and all ordinary judgment toils after our interest in vain. But *prima facie* the positive judgment has an advantage in this respect over the negative. A positive content is at all events something; it is an instalment in satisfaction of our interest. If I say that the fire is burning in the dining-room, this judgment is no doubt compatible with various grounds and various consequences, and in the judgment as I mean it some particular ground and some particular consequence are probably included. Such a statement would not be made *à propos* of nothing, or if it were, it would be resented just as talking gibberish would be resented. There is some point or purpose to which it must be taken as contributing, and some reason—though possibly falling outside the content of the judgment—which serves as a ground for making it. But over and above all this there is, in the affirmative judgment, the positive logical content itself, which, though modifiable within very wide limits, yet cannot be modified beyond certain limits. The judgment may be in praise of some one's thoughtfulness, in condemnation of their extravagance, in contempt of their effeminacy, or in alarm at their carelessness. But there is a nucleus, not indeed fixed nor free from ideal selection and synthesis, yet not quite indefinitely variable and

containing a positive element of appeal to normal perception.

In a negative judgment strictly interpreted as mere denial this nucleus is lacking, as the consideration of bare denial taught us. Therefore we have nothing left but those elements of meaning to which the interest of predication is the sole clue. Let us take a plain every-day judgment such as 'A. B. is not a dishonest man.' If we enunciated this proposition in the sense of the infinite judgment, meaning e.g. that A. B. is not a man at all, but a stone or a monkey, we should unquestionably be held to have violated the conventions of speech. The meaning of every judgment is to be looked for in the attribute to which is attached the interest that guides the selection of the content used in judging. But this attribute must obviously have definite relations, at any rate for some special purpose, to the content affirmed or denied. Whether it can precisely coincide with the content affirmed is a point to which I shall have to recur; but it cannot precisely coincide with the content denied, for if so, no result in which we had an interest would spring from the denial—the whole reason of our interest would be cancelled and be put away with the denial of the attribute on which it centred.

Now I may be interrupted at this point with the objection that this is exactly what is always happening in negation. When we have suspected a man or thing of having some attribute which interests us, and then find that we were mistaken, our interest in the individual may, and often does, fall dead at once. A man may be pointed out to us in a crowd as about to be our fellow-traveller on a difficult journey, and we may regard him with some interest on that account; but if we learn that it was a mistake, and that we have nothing to do with him, we shall probably after that regard him as 'nothing to us.' This is in fact almost a recurrence to the infinite judgment; for though we must know that he is a man, yet so long as he is not to be our fellow-traveller we do not care whether he is alive or dead; i.e. for any positive quality of his humanity. The judgment 'he

is not coming with us' approaches then to a judgment of bare exclusion, the attribute in which we have interest being the attribute excluded.

In the first place, I think, we must to a great extent admit this contention; and simply refer it to a difference of degree. Negative judgment does begin with a phase inappreciably differing from the infinite judgment. But yet, of course, the question 'Coming with us?' must have originated in some such judgment as 'He is the sort of person who might be coming with us;' and it is within this fact judged true that the ultimate negation 'not coming' has its meaning. The interest is first awakened by the whole attribute 'such as to come,' and could never have been aroused but for the presentation of such an attribute. If the negative judgment were really one of bare exclusion it would apply equally well to everything in the world, and no interest would have been aroused which could have led us to make it of a particular individual. But in the second place, it must be added that in as far as, in the alternative which formally arises within the attribute 'such as to come,' all the interest practically falls on one side of the alternative, this is an actual defect of knowledge and morality, but has not, in the case supposed, been pushed far enough to prevent the insistance on the positive attribute 'capacity to come[1].' And this attribute supplies in fact a positive content for the denial, though we by the hypothesis happen to be now indifferent to it. The denial really contains the judgment, 'The man is one who, we

[1] It is a commonplace satire to say of a man that the universe interests him only in as far as it is what his particular whim requires. What is not money, or total abstinence, or woman's emancipation, as the case may be, is nothing to him. This is a good illustration of the moral and intellectual impotence indicated by any approach to bare negation. Hegel has quaintly compared the distinction between bare and significant denial to that between crime and civil dispute. If I steal, my act says 'This is not yours,' without asserting that it is mine or any one's by right, i. e. it ignores the whole sphere of property or reasonable possession by alleging no ground for its denial. In a civil dispute I say 'This is not yours, because it is mine,' i. e. I assert rights of property, as you do; but I deny your right on the ground of mine.

thought, might come, but is not coming.' The proximate case in the ascending scale of knowledge may be illustrated by supposing that instead of our interest dropping dead on hearing that he does not come with us, this negative judgment enunciates to us a regret that he is not coming, implying that we ascribe to him some positive quality which causes us to regret losing his company. In this case the positive bearing of the negation 'He is not coming with us' is primarily a *consequence* of the negation operating upon the judged content 'We should wish him to come with us.' This consequence supplies the denial with a positive import, and may be the only aspect of it prominent in the mind.

But there is something else to be considered. Every judgment without exception challenges the question 'Why is it so?' or at least 'How do you know it to be so?' the former question demanding the cause or real ground, the latter demanding the cause of knowledge or logical ground. These two kinds of ground run into one another, as we saw, and need not be distinguished for our present purpose. In denial, then, there must be *this* element also of positive import, the attribute which justifies the denial for us. It is plain further that in case of the non-existence of the immediate or apparent subject, this attribute may be judged directly of Reality, which is the ultimate subject in Negation as in all Judgment. 'The house on the marsh is not burnt down' may be true because there is no house on the marsh, and although reality—positive fact—excludes the burning down of any such house[1].

Thus in Negation we have two positive elements which may be present together, or in various relations of promin-

[1] It may be objected that in such a case to say 'The house on the marsh is burnt down,' is not so much false as unmeaning, in other words that the negative 'the house is not burnt down,' has meaning only if there is a house, and presupposes or asserts that there is one. I have strong sympathy with this objection, which turns on the problem of a real distinction between subject and Predication within the Judgment. But an unmeaning judgment is clearly not true. The only doubt is whether its not being true justifies any negative except one which should brand it *as* unmeaning, e. g. 'There is no house to burn down.' The more hypothetical judgments are, the less they present this difficulty.

ence, or may wholly or partially coincide. The third element of import, the positive content explicitly employed in judging, falls away in the negative judgment, being replaced by a bare exclusion of an explicit content. This bare exclusion is what we discussed on its own merits in the second section of the present chapter, and found to amount in itself to nothing. We are therefore referred for the meaning of significant negation to the positive ground, or positive consequence, of the exclusion which forms the outward and visible shape of negation. Thus we approach the solution of the problem how knowledge can take the form of ignorance—how 'what it is' can be known through knowing 'what it is not.'

The primary analysis of the significant negative judgment presents therefore a close parallel to that of the hypothetical judgment. 'A is not B' may always be taken to='A is x which excludes (or which is implied in excluding) B.' Or in extreme cases we may have 'Reality is x, which excludes or is involved in excluding A B.' Just thus we saw that 'If A is B it is C' may always be interpreted into 'A is a factor in a real system x which given A B involves C;' or in an extreme case, 'Reality contains a system x such that, if A B were placed within it, C would result.' We examined at length the conditions under which such a relation as that enunciated in the hypothetical judgment could be made intelligible, and we found that a real system within which the separate terms should be interdependent was the bond of union which alone could justify such a reference of one thing to another. In the same way we saw that negation presupposes a real system—a system affirmed in judgment to be actual—as a condition of its intelligibility; and if it is replied that a system presupposes negation—for it presupposes difference—we must answer, first, that negation in its pure form as simple contradiction is the abstraction of difference, and *may* be later in origin than, or at least presupposes as coeval with it, the positive differences which all thought involves; and secondly, that in thought it is

possible and indeed is the rule for factors to presuppose each other, and to grow into distinctness *pari passu.* In fact, Negation *is* simply the *logical, conscious* expression of difference.

Significant negation, then, like hypothesis, is intelligible within and with reference to a system judged to be actual. It is only within such a system that something can be made out of nothing by implying a positive ground or consequence in a bare denial. In other words, the essence of formal negation is to invest the contrary with the character of the contradictory, or to raise mere discrepancy or positive opposition to the level of the absolute or contradictory alternative which is the abstraction of difference. It is only contradictory negation which allows a conclusion to be formally drawn from the negative; contrary negation does not admit of this. It is only contrary negation which allows any import to be materially attached to the negative; contradictory negation does not admit of this. The fact that contrary negation can be given the force of contradiction, that a positive opposite can be known as a sole alternative, and that unless this is done knowledge remains inarticulate and chaotic, is simply the fact that Reality is a system. It is in considerations of this kind that we must look for a reconciliation of conflicting ideas as to the 'subjective' or 'objective' place of negation. We must ask in every case *what* negation? The negation of what and under what presuppositions? Without going further into extreme views about the objective import of negation, I am most anxious to persuade the reader that the fruitful question is not 'Can we conjure a meaning out of a bare denial?' but 'Why is it that in knowledge we cannot do without denial?' 'In your "system of differences,"' it may be said, 'you put a significance into your negations, and then pride yourself on finding there what you put in.' This is true. What I want to insist on is the fact that this kind of significance cannot be put into anything but negation, and the light which this fact throws on the significance

in question. Reality is a system, and you cannot have system apart from negation. This is the central fact from which all enquiry must start. The connecting link between difference, contradiction, and contrariety[1] is that difference becomes contradiction when taken as mere difference or as the abstraction of difference, that is, as expressed in a negative judgment which (like the infinite judgment) professes *merely* to exclude a given idea, or deny a given affirmation. If the denial were within a self-identical system it would carry a positive bearing. As *ex hypothesi* it has no positive bearing, it embodies mere difference without identity, or the abstraction of difference. Such a denial is the pure contradictory of the affirmation which it denies. On the other hand, difference becomes discrepancy or contrariety when not the formal abstraction of difference, but positive differents claim the same place, and the same place means the same relation to the same system. Such contrariety exists between 'A is B_1' and 'A is B_2.' Thus the articulate arrangement of differences under their systematic relations is the root of positive discrepancy. The system as determined by one relation excludes, under that relation, the system as determined by any other; and the system as a whole identifies any one of its *positive* relations with the mere difference from, i. e. the bare exclusion of, certain other positive relations. A is either B_1 or B_2. This is the combination of Contradiction and Contrariety.

It is not essential that the positive ground and positive consequence of a denial should be different. Under conditions of precise knowledge they must be the same. We shall see that where only two alternatives are possible, and they exclude one another, either of them is denied by the affirmation of the other, and affirmed by its negation. Under such conditions the denial of one alternative has the affirmation of the other both for

[1] See below, Book II. chap. vii, on the 'Formal Postulates of Knowledge.'

its ground and for its consequent. 'He will either dissolve or resign' permits us to understand under the denial 'he will not resign' the affirmation 'he will dissolve' alike as its ground and as its consequent. It is plain that in actual knowledge there are degrees of this coalescence. The ground may be imperfect or extraneous; it may be replaced by any positive quality that excludes the predicate denied, i. e. in this case, excludes resignation. This positive quality might be even difficult to formulate precisely, and might run as close as possible to a bare denial; we might feel sure that 'he is not the man to resign;' which means that his general character as we understand it precludes the idea that he will resign. Such a general *ground* would be at once reinforced in its cogency and restricted in its result by the *consequence* of the denial, the necessities of the case being as supposed above. The two in their coalescence, 'he is a man who will not resign,' and 'not resigning, he must dissolve,' would in that case form the complete analysis of the denial 'he will not resign.'

It has been necessary in this discussion to anticipate the account of disjunction which will be given in the next chapter. Perfect disjunction is of course a late form of knowledge. But it is an ideal inevitably involved in the nature of negation. All significant denial—all denial, that is, which rises above the level of the infinite judgment—corresponds to this ideal in two respects at least. Every denial has its meaning within an attribute or set of attributes judged to be real; and every denial affirms some positive matter which affects and is affected by its relation to such a comprehensive attribute. This may be illustrated in another way, which will also serve as a recapitulation of the stages of negation.

Negation is rooted in the fact of difference, but difference is not enough to warrant negation. Mortality is a difference within the identity of man, but we do not therefore deny that man is mortal. Significant negation begins, we

said, when positive differents claim the same place in the same system—in the simplest case, when differents claim to be identical. Man is not mere mortality, i. e. does not coincide with mere mortality in the system of reality. As thus conflicting, which of course can only happen *in a judgment*, differents are contraries or opposites, and the assertion of one is the negation of the other. Now these contraries or opposites may be of any number. There is nothing to limit them. Any colour is the contrary or opposite of black, if asserted in the same relation; and so would any sound or taste be, *if asserted in the same relation*, which seems impossible for a sane man. If then we consider negation at this stage as embodying contrary opposition, what follows from it? 'This surface is not black' has indeed a ground, viz. that it is some particular other colour; but what about the consequent of the negation? There is none, except that the surface is *some* colour other than black, and therefore we lose by choosing the negative expression rather than the positive, and the significance of the negation *qua* negation is absent. What follows from the absence of a consequent as definite as the ground? Nothing less than this, that negation cannot be explained on the basis of mere exclusion of contraries. It is indeed possible to deny intelligibly on such a basis, in virtue of the general consequence of negation, but no reason can be assigned for in such a case preferring negation to affirmation. For in the case supposed we should be concluding from 'A is red,' through 'A is not black,' to 'A is of some colour other than black'—a manifest loss.

Negation can have no bearing, i. e. no interest or *raison d'être*, unless the contraries are limited so that something follows from the negation. In other words, Negation always *involves* Contradiction between contraries and not merely Contrariety. There may be any number of alternatives, but unless the number is limited or falls within some positive characteristic however vaguely known, nothing can follow from the denial either of one or of any number among

them. Therefore though negation originates in difference, which it raises to contrariety by embodying it in definite relations, and though it does not arrive at formal contradiction between opposites till long processes of thought and language lie behind it, yet I am unable to comprehend how any negation can have interest apart from being taken within a positive whole, however vague, which is of the nature demanded by the relation of contradiction when established between opposites. Mere contradiction as between 'he is good' and 'he is not good' is given in the nature of negation from the first; and its development consists in filling this unmeaning form with significant opposites, so that from 'he is not good' we may be able to infer something more than that 'it is not true that he is good.'

Significant Negation then combines in itself the absolute Contradiction which was illustrated by the Infinite Judgment, and the Contrariety which arises between differents when referred to the same place in the same system. Without contrariety negation would have nothing that it could mean, but without contradiction it would not have in itself the power to mean anything.

Opposition and conversion of Judgments.

4. The rules of the opposition and conversion of Judgments, which have come down to us almost as Aristotle formulated them, are founded on the classification of judgments according to 'quantity.' They therefore lay down the relations to one another of all classes of judgments which this principle recognises, in as far as the truth or falsehood of any one judgment affects the truth or falsehood of any other which deals with the same content. But when we attempt, as we have attempted above, to distinguish the *kinds* of truth which various types of judgment embody, then the relations between the various classes of judgment cease to be a matter of mechanical rule-of-thumb, although not hard to understand if we pay attention to the actual significance of the judgments with which we deal.

Opposition.

i. The principle from which we must set out is that everything which can be affirmed can also be denied. In some cases the denial will be confined to a shape closely corresponding to that of the affirmation, and in some there will be two kinds of denial which will fall apart.

Between Singular Judgments.

a. The Singular Judgment cannot be treated for the present purpose as a case of the universal. It has, as we saw, a universal character, but not in the sense of referring to an aggregate of individuals. If 'Caesar crossed the Rubicon' is true, 'Caesar did not cross the Rubicon' is false; and if the negation is false the affirmation is true. Thus the relation of Contrary Opposition, according to which the Universal Affirmative and the Universal Negative of formal logic may both be false, falls away in the case of a Singular Judgment in our sense of the term. In this type of judgment we have the simple relation of affirmation to formal negation which is contradictory, i.e. presents an absolute alternative. The reason of this we shall have further to consider in treating of Double Negation.

Between Plural Judgments.

β. The Judgments of Enumeration, Plural or Particular Judgments, including the Collective Judgment, present the relations towards each other with which we are familiar in the common scheme of opposition. The peculiarity of these relations is that in them an absolute alternative or contradictory opposition is only to be obtained by opposing judgments of different quantities. The reason of this is well brought out in a phrase which Aristotle employs in his account of opposition, where he states the contradictory of 'All are' to be 'Not all are'—instead of using the expression of our text-books 'Some are not;' or when he says that the contradictory of a proposition which affirms a predicate universally, is one which asserts that of the same subject the predicate is not universally true. What is affirmed in a collective judgment is the homogeneity in a certain respect of an aggregate still regarded as an aggregate of enumeration, although endowed with

sufficient unity to warrant itself as a completed whole. The denial of the judgment is the denial of this homogeneity, and is rather a consequence of than identical with the partial counter-enumeration which our logic-books take as its type. If, for instance, we assigned a number to the counter-enumeration, the contradiction would no longer be complete, and we should find ourselves in contrariety instead. To say that 'All these books are German' and that 'Two of them are not' cannot be a contradiction pure and simple; for the falsehood of 'All these are' is compatible with the truth of 'Two—three—or all of them are not.' This is enough to show that 'some not,' if we take it as a sign of counter-enumeration, is less safe in contradictory opposition than 'not all.'

As regards the 'contrary' opposition of 'All are' and 'None are,' the doctrine of formal logic is true so long as we confine ourselves to Judgments of Enumeration. 'None are' asserts a complete counter-enumeration or its equivalent based on some other ground, and besides this assertion and its contrary there are as many alternatives as there are individuals in the aggregate, *minus* one.

The particular or incomplete collective judgments 'Some are' and 'Some are not' (sub-contraries) are of course compatible with each other so long as we do not determine them numerically; and continue to be so then if we consider that incompleteness of enumeration debars us from all reference to a sum total. If on the other hand we permit the comparison with an assumed sum total, we pass at this point into calculation. The general conception under which we are enumerating always, it must be remembered, implies a total; so that calculation lies very near to judgments of this type. 'Six men were killed and ten wounded (but not killed)' are judgments perfectly compatible with one another if the number of men on the ground was sixteen or more; but if there were only fifteen or fewer, then the two judgments at once rise into contraries. Both may then be false, but one must be. This however *is* calculation.

This account of the matter includes all that need be said of the Singular judgment if used in opposition to the Collective judgment. In such a case the Singular judgment takes the place and follows the rules of a judgment of Enumeration. It must however undergo a transformation, even if only implied, in taking on a relation to the basis of enumeration. 'How many Liberals voted against the Bill?' 'A. B. did, C. D. did,' &c., &c. These singular propositions are read off into enumerative judgments, 'One Liberal, two Liberals,' &c.

The further judgments which arise out of the Judgment of Enumeration and Measurement follow the characteristics of those forms of the true universal judgment to which, whether as generic or as hypothetical, they severally approximate.

Between Generic Judgments

γ. I will now point out shortly the characteristics of these judgments themselves when placed in opposition. The tendency of the higher stages of knowledge is, as we saw in the last section, to fuse contrariety and contradiction into one. This is obvious, for instance, in the individual generic judgment, for the same reason as in the singular judgment itself. And even in the analogical judgment the tendency to fusion is strongly marked. The allegation of exceptions against a generic character, whether in form of expression positive or negative, must either be insignificant as when the exceptions are apparent and not real, or else tend by analogy to establish a contrary alternative or *positive contradictory*. In the former case the judgments which emphasise the exceptions must be taken to be not generic judgments at all, but mere enumerative judgments, which therefore cannot touch the essence of the generic judgments they appear to oppose. For we shall find the dominant principle in these relations to be that a judgment of one type α cannot deny a judgment of another type β; although the former may suggest a judgment of the type β which will constitute a full denial of the other judgment of that same type. Under the head of such mere enumerative

judgments would come all observations of artificial forms, mutilations, abortions, etc. in organic and spiritual beings; and all accidental juxtapositions rendered by judgments whose subjects have no connection with their predicates. The generic judgment 'Man is a creature with a sense of justice' is not invalidated by instances drawn from dead men, lunatics, or idiots; nor even, perhaps, from criminals, if there are such, whose conscience is obliterated by life-long war with society. But I shall be told that a scientific law has no exceptions. This is just what I am maintaining; I am saying that exceptions are either apparent or real, and in the former case, that now before us, do not deny the law; in the latter proceed positively to indicate another law. In the second case, when the law is really impeached by the bearing of the exceptional instance, this bearing must have a positive import, which may not amount to a suggested law, but must be in the same region of essential individuality in which the characteristic that is denied has its import.

If I say that all exogenous trees are dicotyledonous, I am opposed by a real, not merely apparent, exception in the case of the Coniferae, which though exogenous have in many species more than two cotyledons. Here we have one Generic judgment (I use 'generic' in the logical sense which I have explained) opposed to another. It is not merely that here and there an aborted or mutilated instance is to be found in which a part of the plant is wanting; but that an enormous natural order with marked unity of habit, and in the strictest sense[1] sharing the characteristic on which the analogy is based, does not display the character required by analogy. Now I am not aware that any importance has been attached to determining the connection between exogenous wood-

[1] Here an error is possible. The wood-formation of Coniferae, though proceeding from a cambium ring outside the old wood, has differences from that of Dicotyledonous Exogens. If these differences were of importance the exception might break down as not a case under the rule, Coniferae not being true Exogens.

formation and the number of seed-leaves or cotyledons; but it is plain that the conflict of generic judgments so far as we have followed it does not destroy the idea of such a connection, which would be the effect of a mere contradiction, but suggests that it may be characteristic of plants with two *or more* seed-leaves. Supposing that monocotyledons were also found in some cases to form wood externally, the question would still arise whether any principle of development could be traced according to which the characteristics under discussion might arise together or owing to connected causes, as if e.g. there was a point at which the one natural kind approached very close to the other. If so, the supposed further exception would still lead to a positive principle or contrary, and not to an empty contradiction. Even if the first generic judgment were a sheer blunder and confusion, as has been the case from time to time with judgments propounded in science, it is scarcely possibly to rectify the confusion except by substituting for it the true positive conceptions that arise out of the cases which overthrow it. An example in point is Ehrenberg's inclusion of a group of confervoid Algae (Volvox) under the class of Infusorial Animalculae, or again, probably, his alleged detection of highly-organised structure in the Infusoria proper. Enumerative exceptions are futile in such cases; what is needed is a re-interpretation of the character of the group as such. Such a re-interpretation is at once contrary and contradictory to the mistaken judgment which it corrects. But in the process of interpretation it may and perhaps must pass through a stage which may best be described when we are speaking of the hypothetical judgment.

Between Hypothetical Judgments.

δ. The *contrary* of the Hypothetical Judgment is as usual a judgment of the same type. The complete contrary of 'If outdoor relief is refused the workhouses are crowded' would be 'If outdoor relief is refused the workhouses (*caeteris paribus*) are not crowded.' This denial means that the condition expressed in the hypothesis 'If . . refused' is

not merely inoperative to cause pressure on the workhouse, but is actively operative to decrease that pressure. I insert the limitation *caeteris paribus* merely to secure the judgment being taken as truly hypothetical, because in such concrete matter as this there is a tendency to interpret the judgment as collective in the sense that 'Every case of α is a case of β;' so that it may be objected to on the score of accidental instances. In abstract matter, e.g. in geometry, where the hypothetical judgment has an unambiguous import, these objections are understood to be inadmissible. Parallel lines are taken *qua* parallel when it is said that they do not meet, and so forth.

This contrary is the form of negation to which all precise thought aspires. If the condition is irrelevant and wholly unconnected, then indeed the entire type of knowledge to which we have aspired is a delusion and a snare, and the mere contradictory which will express our ignorance must be found in a judgment of a lower type. But if the condition is relevant it must operate somehow, and we can only choose between one view of its operation and another. Such a choice is expressed by embodying mere contraries in an absolute alternative or contradictory; by considering 'If A is B it is not C' as the contradictory of 'If A is B it is C;' as it is the *only* way of denying it *by a hypothetical judgment.*

But if we are to destroy the hypothetical judgment itself as an expression of ground and consequence, we must aim our negation precisely at its form. The enumerative particular would not help us here. When we have said that 'If (i.e. in so far as) a man is good he is wise,' it is idle to reply that some good men are not wise. This is to attack an abstract principle with unanalysed examples. What we must say in order to deny the above-mentioned abstract judgment is something of this kind: 'If,' or 'Though a man is good, yet it does not follow that he is wise,' i.e. 'Though a man is good, yet he need not be wise.' The particle 'though' introduces the condition as a supposal, but by its

adversative force prepares us for a denial that it has any connection with the consequent.

This same form, which may be called the modal particular, is the appropriate contradictory to a generic judgment which has to be altogether surrendered and cannot be corrected by a positive contrary. Its meaning is however not as clear as that of the Generic or Hypothetical judgments. For it does not assert a positive relation, but drops down into an unanalysed quality of exclusion, and thus into the confused concrete of phenomena. It may therefore mean that the supposed condition is inoperative and irrelevant, or it may mean that it is weakly operative and liable to be overcome by normal counteracting conditions, or that it is operative as asserted in the hypothetical judgment, but liable occasionally to be overcome by exceptional conditions. This last is a common meaning, but is not the true negation of the opposed abstract hypothetical judgment, and ought to be discarded from science, though there is no means of relieving the modal particular negation from it. How then are we to treat the correlative case, in which we deny 'If A is B it is not C' by 'Though A be B yet it may be C'? This seems to confirm our view that the character of mere negation is incompatible with that of the hypothetical judgment. For the former of these two contradictories is of course the same judgment which we have already considered in the light of a contrary and *positive* negation; and the latter seems therefore to retain under its affirmative form the essential character of mere denial. 'Though A is B yet it does not follow that it is not C' expresses the only sense in which the affirmative modal particular is a true or mere contradictory to the negative hypothetical judgment[1]. This sense is not in itself satisfactory if taken as the import of possibility, and real possibility demands a nearer advance towards the affirmative contrary—a recognition of some real operative condition making for the connection alleged possible. That this is so only confirms

[1] See below, on Privation and Affirmation.

the suggestion made above that in significant negation contrary and contradictory tend to become one.

I may anticipate the case of Disjunction so far as it here concerns us by saying that the denial *of* a disjunctive judgment, though formally possible, is not a problem that naturally arises in logic. The disjunction is the pre-supposition and the goal of negation as an *organon* of knowledge. By denying it as a whole we sweep away the fabric of knowledge relative to the matter in hand, and must begin over again from the beginning, as there is no sphere left within which anything can arise from the denial of the disjunction. To deny a disjunction in this sense we should not trouble ourselves with the alternatives, but analyse them into their common basis and deny that. An impersonal judgment, as expressing wholly inarticulate knowledge, is the appropriate form for such denial, *unless* we are denying one disjunction under another. 'The soul is neither square nor round' may be denied by 'The soul is not in space;' for this denial has a positive ground and consequence founded on an implied disjunction, 'either in space or intellectual.' But if we are presented with a number of alternatives about a matter which seems to us to have no basis in reality nor relation to actual knowledge at all, then we may reply with the impersonal negative as the form of thought most suited to mere absence of positive content. 'The disembodied spirit in its earthly presence is revealed either by contact or by signs.' To this an entire unbeliever would probably answer, 'There is no earthly presence of disembodied spirits,' and here he approaches, not wholly by his own fault, the infinite judgment. He has merely said that reality is without the matter alleged, and his saying has no positive import beyond what arises from the imputation to reality of a character—whatever that may be — not necessarily incompatible with, but rather undistinguished by, the presence of disembodied spirits.

Specific denials of a disjunction on the ground of incom-

pleteness or superfluity[1] are of course either under a further disjunction which the denial tends to make explicit, or in the second case, *prima facie*, under the disjunction to be denied itself, with the result of excluding one of its alternatives.

Double Negation.

ii. In treating of the contradictory relation, that namely between two judgments of which one simply denies the other, so forming an absolute alternative, we saw the results that spring from *double negation*. We appealed to double negation for instance in the case of the singular judgment, such as 'Caesar crossed the Rubicon.' This, with its simple denial 'Caesar did not cross the Rubicon,' forms an absolute alternative, although the denial has a meaning and is not a mere infinite judgment. So far as this is the case, the opposition between the two is at once contrary and contradictory.

Do the two cases of inference from falsity in contradictory opposition stand on the same footing? The one is from the falsity of the affirmative, the other from the falsity of the negative. The former amounts to single, and the latter to double negation.

The explanation of single denial which has been given above may be briefly restated here. The abstraction of difference, taken in respect of its contrast with identity, and so as mere non-identity or otherness, is employed in negation as the vehicle of a positive contrary, which contrary is thus invested with the full alternative force that belongs to otherness as such when contrasted in the abstract with sameness as such. As regards the history of early thought on this question, of course we are not to look for determinate abstractions in primitive minds. But primitive minds probably are abstract, though they do not deal with abstractions. We must look for the germ of contradictory negation in mere repugnance or repulsion, which, although a positive state, has a peculiar aspect of negativity to which the inarticulate abstractness of the primitive mind lends an aspect rather of contradiction than of contrariety. Every one who has watched children

[1] See following chapter on this case.

must have noticed the remonstrant 'No' without any *expressed* content, which is a sign of aversion to something done or suggested. The absence of *indicated* reference to any particular matter is often surprising, and impresses an observer by the difficulty of finding either the bearing or the ground of the negation. Here it is rather the positive contrary that is undeveloped and latent than the mere rejection or contradictory. Therefore I cannot but think that the absolute alternative—mere generalised otherness or rejection—makes itself explicit by the side of the positive contrary at a very early stage of thought.

Thus though I do not take every negation to be necessarily aimed against an affirmation of the same content, yet it seems to me that the pair of judgments which form a contradictory opposition embody an ultimate fact of knowledge. Single negation is in form the substitution of *mere* difference, or nothingness, for the combined identity and difference which alone have meaning. This form is the basis of the alternative in contradiction. It is the alternative antithesis between something and nothing. That 'nothing' is furnished with a meaning *in hunc effectum* does not appear from or affect the form of contradiction. Single negation, then—the passage from the falsity of 'A is B' to the truth of 'A is not B'—must be regarded on its formal side as the abstraction of a universal characteristic of knowledge. It means that A is, under the conditions and for the purpose of the judgment in question, in a relation of *pure* otherness to B.

The case of double negation—the passage from the falsity of 'A is not B' to the truth of 'A is B'—is in my judgment accounted for by the preceding remarks. The true problem, to my mind, is not how negation should be the absolute alternative of the corresponding affirmation, but rather how, being in its exterior form and vehicle such an alternative, it should become possessed of positive intelligible import. The fundamental nature of negation,

thus understood, may no doubt be embodied in the principle of Excluded Third or Excluded Middle, which asserts that of two contradictory enunciations one must be true and the other false. Thus stated, the principle is merely formal, because the question immediately arises, 'What are contradictory assertions?' The definition might be made plainer by substituting for the phrase in question an expression such as 'the assertion and denial of the same content;' but no definition can relieve us from the task, which I have attempted to perform in this chapter, of explaining what a mere denial of an assertion really is. Excluded Middle is thus merely the abstract case of Contradiction or simple negation, and the proof of the principle lies in the analysis of negation.

I may illustrate this view, in the case of double negation, by two conceptions that deserve attention. Sigwart ascribes the affirmation that admittedly results from double negation to the reappearance of an original affirmation at which the first negation must have been aimed, so soon as that first negation is cancelled by the second. I take this view to be true in substance, but false in the fact which its expression postulates. It was pointed out above that not every negation presupposes an affirmation, and that Sigwart himself, when not treating of double negation, more correctly postulates as the condition of denial only an *attempted* affirmation. But it is true, and this is probably what Sigwart meant to convey, that every negation bears on its face the nature of an alternative, so that, though we may not in fact have proceeded to it by denying an explicit affirmation of the same content, we are yet able to go from the negation of one member to the establishment of another. It is one thing to say that every negation *is* preceded by a corresponding affirmation,—for we may not have judged on the subject at all,—but quite another to say that every negation bears on its face that, if we judge, it is the sole alternative to the corresponding affirmation. This principle appears to me to be of the essence of the matter.

It is this that gives double negation its distinctive precision and emphasis.

In opposition to Sigwart's idea, erroneously expressed as I admit it to be, of re-establishing an original affirmation, Mr. Bradley has maintained that the warrant of double negation simply consists in this, that in order to deny a negation we must already be in possession of the corresponding affirmation. We can only, he contends, deny A is not B on the ground that, within our knowledge, A is B. This allegation is made with good reason. We can indeed deny A is B on the ground that A is x or y, each of which excludes B; but we cannot assert A is B on the ground that A is not x or y, each of which excludes B. We cannot deny the consequent not-B on the strength of denying the antecedent x or y. The old rule of the hypothetical judgment, 'Affirm the antecedent or deny the consequent,' forbids this.

But on looking closer we shall observe that this impossibility is based on the imperfect view of the hypothetical judgment which assimilates its rules to those of the judgment of enumeration. This view disregards the possibility of a connection at once synthetic (i.e. not tautologous) and pure (i.e. free from irrelevancy). For in this case the denial of the condition is the denial of the consequent; and it is this which has been before us throughout as the essential and ideal meaning of judgment. This assertion of a pure connection between condition and consequent becomes, in the case of a negative consequent which is now before us, identical with our position that all intelligible negation takes its meaning from contrariety, though its form may be that of contradiction. To say that in 'If A is x it is not B' we cannot go from 'not x' to 'not not-B' (i.e. to B) is to say that there cannot be contradictory opposition between contraries [1].

[1] The negative character of not-B might cause a difficulty, but is not in dispute here. What is disputed is the possibility of getting to *anything* by denying that A is x in the judgment 'If A is x it is not B.'

Contradictory opposition between contraries can of course exist only if the possibilities are limited by means of a disjunctive judgment, and in this case Mr. Bradley admits that the double negation may be got at otherwise than by the corresponding affirmation. If we divide all Liberals into Unionist Liberals and Gladstonian Liberals we can go from 'That Liberal is not Unionist' to 'He is not not Gladstonian.' So too in a pure nexus with a negative consequent: 'If powder is slow-burning, it does not strain the gun unequally.' Under this judgment, if we know that the powder is not slow-burning, we are able to say that it fails in the quality of not straining the gun unequally. We can unquestionably get this inference whenever we approach the knowledge of a pure ground. The pure ground and the limitation of cases are merely different aspects of the same form of knowledge. The ground is the fundamental and operative character by which a system imposes certain relations on its parts; the limitation is the external and formal consequence of these relations which may be mimicked for the purposes of common logic by an arbitrary or conventional restriction of alternatives.

My only difference from Mr. Bradley consists therefore in the view which I have maintained throughout, that apart from some limitation there is no intelligible negation—nothing but the infinite judgment, and therefore in strict logic no negation at all. Under such a limitation we can always go from denial of a positive quality to a positive result which we may as a matter of both theory and of fact approach from the side of double negation, although of course the identity of double negation with affirmation is in a reflective stage of culture too immediate to admit of the two being really distinguished. The reason for which I am anxious to insist on this not very practical distinction will appear more clearly when I come to speak of induction. It is, in brief, the importance of the negative instance; that is, of approaching any positive content from the side of its limit, of the exact boundary at which it ceases and

some other content begins. For this boundary is a negation by denying which we not only affirm the content that lies within it, but affirm it in its conditions and genesis, at least for knowledge. 'If a nation has no true art it is not religious' is a judgment that gives the analysis of a group of 'negative instances,' which analysis passes into an affirmation supported by those instances, in the form 'A nation which has true art is not not religious.' The conclusion thus obtained, 'This nation (having true art) is religious' may be *bonâ fide* arrived at through the double negation I have described, and may be at first unsupported by the direct observation 'This nation is religious.'

Conversion.

iii. Conversion is usually treated with opposition under the head of immediate inference. It is primarily a transition from one grammatical form to another which introduces no new elements into the content. Whether, or in what cases, it really involves inference, i.e. a passage from one *judgment* to another warranted by the first, is the main question which arises in treating of it, and of course includes the problem *what* inference, if any, is involved.

The unity of the judgment, it will be remembered [1], does not exclude a considerable measure of diversity. It is often a mere chance whether a range of affirmative thought is condensed into one proposition or comminuted into several. And inference is working through the whole of such a range as the judgment gains depth and width, and defines its edges. Thus, if we mean to say anything definite about the point at which we pass from one judgment into 'another,' we must look at what is *bonâ fide* implied as the essential import of the judgment-forms that we discuss, and not at the actual transitions which attend our interpretation of any proposition, and which vary with mental endowment in the interpreter, and with the lucidity of expression of the given sentence. That is to say, we must distinguish interpretative inference from substantial inference—transition within the judgment from transition between two judgments.

[1] See above, chap. i.

The question may seem indeed to settle itself at once. The unity of judgment is determined *prima facie* by the unity of the Content judged. A new subject or a new predication, i. e. one not related as part within whole to that of a given judgment, is needed to constitute another judgment. But in immediate inference there is no new content—at any rate no new positive content. Can there then be a new judgment?

The real interest of Conversion lies in the discussion which it provokes of the precise relations imposed upon its content by any given judgment, and of the boundaries which separate the *bonâ fide* meanings of the various judgment-forms. In arriving at these relations or at this meaning we use interpretative inference; it is only when we find ourselves able to go from relation to relation by re-applying the same form of judgment, or from meaning to meaning by passing from a judgment of one type to a judgment of another, that we are really employing substantial inference. It does not much matter, however, where we elect to draw the line of transition from judgment to judgment, so long as we understand the connection of the implications concerned.

Simple Conversion of Singular.

a. I will begin with an accidental case of simple conversion, not recognised in the text-books because the content of predication in singular judgment is not necessarily of singular reference. 'The Duke of Cambridge is Commander-in-chief.' I think it is beyond question that this proposition might be met with 'The Commander-in-chief is the Duke of Cambridge' in a tone which would give it the force of a criticism or retort, although its content would be warranted true by the proposition as first enunciated. I am not prepared to abolish the distinction of subject and predicate within the judgment, and if we retain the distinction, then the mere transposition of the two makes a difference. We understand the subject primarily as a designation and the predicate primarily as an attribution. The idea of concrete individuality clings to the subject, and that of specially selected determination to the predicate. The

second of the above propositions might certainly be understood to mean that the qualities of the office were limited in the relation in question by those of the individual, and not those of the individual adapted to those of the office.

If it is replied that this may be possible enough, but that really one who commits himself to the former proposition has bound himself to know and judge the concrete synthesis of qualities which the predication constitutes along with its subject, I cannot deny that this is so. And I am therefore content to rank such inference as is illustrated by the above transition under the head of interpretative inference, **i. e.** inference that falls within the logical unity of the judgment as *bonâ fide* expressed by either propositional form. It is true that in some simply convertible judgments, e. g. 'A = B in weight,' the order of terms can make no possible difference of import. But the reason of this is not that the proposition is simply convertible, but that the content is of a highly abstract character which annuls all individuality, and thus destroys any significance that might attach to the difference between subject and predication. A similar character belongs in some degree to all quantitative judgments.

Conversion by Limitation.

β. The Universal Affirmative Judgment (under which, in ordinary logic-books, the Singular Judgment is comprehended) is not admitted to be convertible *simply*, i. e. by mere transposition of subject and predicate, but is supposed to be convertible 'by limitation,' i. e. by transposition together with reduction to the level of a 'particular' judgment.

With reference to the first part of this rule, the whole course of our investigation of judgment is a comment on the degree and *rationale* of its truth. It is equally certain that the prohibition of simple conversion is warranted by common usage, and that the 'pure case' (which does not mean mere tautology) is an ideal operative throughout the judging activity. I am confident that Quantification of the Predicate and the Equational Logic owe much of their success to their

recognition of this ideal, though their forcing it upon the ordinary judgment by truncating the meaning of the latter is a blundering *anticipatio naturae*.

The second part of the above rule, the 'limitation' of the converse, has different values as applied to different classes of judgment which correspond to the so-called 'universal affirmative.' If we take a judgment of the collective type and argue e. g. that because 'All houses in this street have gardens' therefore 'Some houses which have gardens are in this street' we do not seem to gain anything by the re-arrangement. And we certainly lose something, for we cannot recover the original judgment by re-conversion of the particular thus obtained. Of course re-conversion can only give 'Some houses in the street have gardens.' But we know, to begin with, that all the individual houses in the street unite with their other attributes that of having gardens. We seem, then, only to have advanced to a doubt of what we knew. There is however a shade of difference suggested, as in the singular judgment examined above, by the mere transposition of subject and predicate. The denomination of the individuals is less emphasised than the content enunciated of it. The former fills the place of pointing with the finger to an object of perception, the latter that of the significant ideas by which the perceptive judgment qualifies such an object. But this transition seems to fall within the interpretative inference, and not to amount to substantive inference.

In the case of the generic judgment of either type the import of the change becomes more emphatic. 'The dahlia is one of the Compositae' tells me that this regular flower, apparently a mass of petals like a garden rose or peony or hollyhock, is really an aggregate of little florets like those of the daisy or dandelion [1]. In short, this judgment distinguishes the dahlia from flowers externally not

[1] In the double dahlia—the form till lately commonest in gardens—every floret is developed into a one-sided corolla like those of the florets which form the ray of the common daisy.

unlike it, but having no structural affinity with it whatever. 'The Compositae include the dahlia,' or 'Some Compositae are dahlias,' presents us with the typical or generalised structure of a Composite flower determined and differentiated by the peculiarities of a dahlia. The rose or peony would in this case never come into our heads; we should be occupied with some such individual as the daisy or the thistle, and the object of the judgment would practically be to distinguish the dahlia from other Compositae, not to distinguish it from flowers which are in no way akin to it. The one judgment qualifies the external appearance of a dahlia by the internal structure of the Compositae; the other qualifies the diagrammatic type of a composite plant, as admitting, among others, of the specific peculiarities of the dahlia.

I have but little doubt that this account represents the meaning of the two propositions *in fact*. But it may be said that we have no *right* to separate them, and that we ought to demand the explicit recognition of both these determinate affinities as essential to the meaning of the generic universal judgment itself; and it may even be insisted that if the second proposition contains more than the first in any respect—e.g. in the more concrete appreciation of diversities of composite structure—then it cannot be warranted by the first. This latter suggestion would make short work of all conversion whatever beyond the rank of grammatical change, unless—*πλέον ἥμισυ πάντος*—mere selection can make the old into new, or unless some principle is appealed to that goes beyond the judgment itself. The former part of the objection may be met by saying that undoubtedly the original judgment *may* be made with the whole significance of the two propositions; but that when so made it is somewhat artificial, and that the distinction of a specific adaptation within the Composite type is naturally a different process from the qualification of a given shape by the abstraction of that type. I may put the antithesis thus: the generic judgment, which we

took as the *convertend*, if completed into identity, would determine the composite type by limitations restricting it to the case of the dahlia; while the particular, in this case the *converse*, if similarly completed, would extend the range of species by disjunctive enumeration till they expressed the whole content of the natural order of Compositae.

Modal Conversion.

γ. This conversion of a generic judgment may be taken either as interpretative or as substantial Inference. Tested by common usage it is, I incline to think, a substantial transformation, resting on some such principle as the possibility of treating every content in turn as quasi-individual. Tested by the logical ideal, it is a mere phase in the interpretation of the judgment, which involves reciprocal determination in the affirmation of a nexus. In either case it contains the only fundamental principle on which conversion can really proceed; viz. that every content can be exhibited as a quasi-individual element in a system. This is, for instance, the principle of which 'modal' conversion is merely a corollary. In the typical example employed above modality has no *real* application; modality only appears where the disjunction is one of ignorance. The particular judgment 'The type of the Compositae includes among its alternative modifications that of the dahlia' *may* be read into 'A composite may be a dahlia,' i. e. the fundamental structure C is a real element compatible with the modification D. But this is a mere consequence of feigning ignorance when we have knowledge; in order to get the possibility we have to imagine that conditions are unknown which in fact are distinctly known and enter into the content of the judgment.

The pure Hypothetical Judgment differs from the Generic by disregarding individuality, and therefore the above principle is disguised in converting a Hypothetical, so that we appear in this case to obtain pure modal conversion. 'If arsenic is taken in such and such a quantity, it will cause death with such and such symptoms,' which gives the converse 'Death with such and such symptoms *at least may*

have been caused by arsenic.' This is a motived possibility or real possibility, not a mere possibility, and forms a substantial conclusion and one warranted by the convertend. But this result is still rather a corollary from the converse, than the converse itself. The example just quoted is one hardly deserving hypothetical form. It involves no traceable modification such as to set up a clear nexus between antecedent and consequence. Thus we cannot assign any precise conditions under which the consequent is related to the given antecedent, and the possibility that such death may result from such poison is merely a fact *plus* unknown alternatives. In a true hypothetical there is more than this. Grant that it is not simply convertible, still we can bring the possibility home to the nature of the consequent. 'If straight lines are parallel, they do not tend to meet.' The real converse of this is, 'Straight lines *in the same plane* which do not tend to meet are parallel.' But the limiting condition is not given in the convertend. Nor do I mean that we have a right actually to state it in the converse, but yet we must think of the converse where such a condition can be suggested as exhibiting a real if undefined attribute of the content which is now the subject, in virtue of which this content includes the case mentioned in the antecedent of the convertend. The affinity between generic judgments and the more valuable hypotheticals is very close, and we lose all hold on the generic element in judgment if we insist on reducing a definitely determinable content to one real alternative in an unknown number of unknown ones. I cordially agree therefore with Mr. Bradley's distinction between *real* and *mere* possibility, and only insist that the true content even of a modal converse is the positive nature in virtue of which the subject-content is variously determinable, and not a mere conjunction of attributes *plus* other unknown conjunctions.

Simple Conversion of Universal Negative.

δ. We are now to speak shortly of conversion in which the negative is employed. Every negation rests, as we have seen, in its purely formal aspect, on the ultimate or

absolute disjunction. But it does not follow from this that a real process of substantial inference takes place where negation intervenes.

I begin with the simple conversion: 'A is not B,' therefore 'B is not A;' 'No negroes have straight hair,' 'No straight-haired man is a negro.' I should certainly prefer representing this transition as a true process of argument to illustrating it by a diagram of two separate circles, because by the latter means we destroy all idea of the structure of the judgment. But yet I cannot think that in our present stage of reflection the argument if any is more than interpretative, i.e. more than we are always using in arriving at the full meaning of any sentence. We can formally trace out the process of inference, but in using it we are like an engine running free and doing no work. No doubt the formal steps are, beginning from the ultimate disjunction between 'is' and 'is not,' to say 'No negroes have straight hair;' 'Straight-haired men are either negroes or not;' 'If negroes, then they are both straight-haired and not straight-haired;' 'Therefore it is false that they are negroes,' 'therefore they are not negroes.' But all this is given in the meaning and practice of any civilised language; and though it might be possible to stumble in using this converse[1], that is no more than may happen in reading any sentence however simple. The elementary meaning is simply that the two contents are in the relation of abstract otherness to each other, and refuse to be brought together in the modified or concrete otherness which subsists within the affirmative judgment.

Contraposition.

ϵ. *Contraposition* seems to contain a more remote conclusion. It goes from A is B, to Not-B is not A, e.g. from 'Every negro has woolly hair' to 'A man who has not woolly hair is not a negro.' I remark on this process, i. that the skeleton argument with symbolic letters seems far more remote and obscure than the intelligible example;

[1] As e.g. if any one tried to argue that 'All not-straight-haired are negroes.'

ii. that we are much hampered in the apprehension of our inference by being forbidden to conclude that 'Not-A is not-B,' which the ideal of judgment demands as the expression of the negative instance, 'Just not-A is just not-B,' e.g.—the affirmative being 'True freedom is virtue'—'If you fail to produce freedom, you fail so far and for that reason to produce virtue.' And, iii. substantial inference is less likely here, for the unity of the judgment is much greater in affirmation than in negation; and when we have just, so to speak, dipped the object *a* in the colour *b*, it seems idle to ask on the basis of that judgment whether what is not of the colour *b* can be the object *a*. We are in fact no longer dealing with *a* and *b*, but with *a b as including all a*. We may say of course, 'Oh yes! not-*b* is not-*a*, because if not-*b* is *a* then it is *b*.' But this remark is made ready to our hand; we have just qualified *a* by *b* and therefore are at least entitled to '*a* is not not-*b*,' which brings back our problem to the last head, that of simple conversion.

In short, then, in both these cases we employ the absolute alternative; but this is given in the *form* of negation or contradiction, and needing no true limitation of alternatives, can only rank as a formal principle of intelligible thought and speech, not as a real addition to content of inference. Transition by help of such a formal principle I call Interpretative Inference.

Privation. Affirmation and Exclusion.

5. The external shape of negation belongs as we saw to ignorance, and significant negation is knowledge disguised as ignorance. For bare denial would be devoid of meaning. Now this external shape of negation seems really appropriate where positive knowledge fails, i.e. in the region of what has been called Privation[1],—the mere absence of

[1] 'Privation,' *Privatio*, used by Sigwart as equivalent to Aristotle's *στέρησις*, *στερητικός*, and as contrasted with opposition, *ἐναντιοτής*, and distinct from negation, *ἀπόφασις*. *Στέρησις* seems to be applied to any negative enunciation, *ἀποφάσις* only to the denial of an affirmation; see Aristotle's Organon, 38 b, 13, with Waitz's note. Unluckily the distinction of privative and negative terms as given e.g. in Whately's Logic has just the reverse meaning to that of

positive determination. But this region is also the region within which there falls the limitation of knowledge, a matter of the most serious and positive import. Where knowledge simply fails us, and consequently we seem to have nothing left but privation or bare denial, how are we to pronounce on any suggested possibility, *α*. by way of affirmation, *β*. by way of exclusion?

Privation and Real Possibility.

The case *α* is the more complicated of the two. The privation or bare denial is in this case the bare denial of an incompatibility with reality, i. e. of an impossibility. *Exclusion*, as we have seen, must rest on a positive quality, a ground of negation. Here, *ex hypothesi*, we can find no *exclusion* of the impossibility. We are supposed to know simply nothing, either *pro* or *con*, about the positive matter whose possibility is in question. Are we therefore bound to admit that it is not not-possible, and, as a consequence of this double negation, that it is possible? If we are led to do this—and the trick is often attempted, especially in popular theology—we feel that we have been cheated. A possibility, in the usual sense of the term, is something. We are foolish if we do not keep it in view and let it influence our deliberations in any way which its nature demands. Yet this something has here *ex hypothesi* been created out of nothing. But in knowledge at least nothing can come of nothing, and we are trapped in a contradiction.

What we have to remember is that our denial of the exclusion of the positive content is or approximates [1] to a bare denial; or in other words, rests upon no positive ground. We do not *exclude* the impossibility; we only fail to find it. And therefore our denial is meaningless or nearly meaningless, and amounts to nothing. In other

privation and negation in Sigwart and Bradley. 'Privative' in Whately indicates a positive opposite, and 'negative' a mere absence. The association with active 'deprivation' implying a *loss* appears to be the cause of this usage.

[1] 'Approximates' for a suggestion, if intelligible, contains *some* ground in its mere conceivability, and thus affords material for intelligible support or refutation. But by far the larger element in the importunity of many suggestions is drawn from the fallacy of inferring from non-impossibility to real possibility.

words, the possibility which we are asked to infer from mere not-impossibility has as so inferred no foundation in positive reality. A real possibility of any result consists in something given as actual, which, under conditions of known nature and not known to be impossible, would give that result. A gun forms a real possibility of shooting, if there is no reason to suppose that cartridges are not to be had; an acorn is a real possibility of an oak, if we know of nothing to hinder its being planted and growing. But in the case supposed we have nothing like this; we have simply nothing—a failure to find incompatibility. Therefore we ought, strictly speaking, to conclude not that it is possible, which is an affirmation, nor even that it is not impossible, which borrows the form of intelligible denial, and therefore presupposes a positive ground of denial, but simply that we do not know it to be possible. This conclusion gives its true value to the form of bare denial by making the ground of negation what in the case of ignorance it really is, an actual state of our own minds which excludes the knowledge in question.

Instances of assertion resting mainly on this confusion are to be found e. g. in expositions of the so-called modern Buddhism, the elaborate dogmatic fabric of which is chiefly protected from criticism by the impossibility of discovering any ground on which it may be taken to rest, and against which, therefore, a positive objection can be raised.

To put the point in other words, in the case before us it is not true that double negation is equivalent to affirmation. For the double negation in question is founded neither on the affirmation itself, nor on the denial of a specific alternative to the affirmation. If there were such a specific alternative to the affirmation, it could only be denied on some positive ground, and such a denial would not be the bare denial of which *ex hypothesi* we are treating.

Or again, without appealing to the difference between privation, i. e. bare denial, and exclusion—a confusion between which processes however is the root of the fallacy—

we may simply lay it down that a real possibility is something actual, and that a bare denial affirms nothing as actual, and therefore a bare denial cannot affirm a real possibility.

And it must be added with reference to remote suggestions generally, that a failure to demonstrate impossibility can almost always be secured by a high degree of remoteness or of abstractness in the suggestion itself. Thus, if accepted as really possible because not demonstrably impossible, such a suggestion would profit by its own wrong. Reality cannot, for us, contradict a suggestion that has no point of contact with reality. Things in themselves, according to the popular notion of the Kantian doctrine, are the content of such a suggestion. They made no claim to affect knowable Reality, and therefore knowable Reality can present no quality which excludes them. As a rule, to disprove the grounds on which a fact is advanced is not the same thing as disproving the alleged fact; denying the antecedent does not amount to denying the consequent. But in the case of unverifiable suggestions the grounds which are implied in the suggestion are for a given state of knowledge the sole grounds conceivable, or at least the grounds which can be stated are capable of exhaustion, and the disproof of them may be taken as for that state of knowledge disproving the suggestion. It must be remembered that denying the antecedent does deny the consequent *qua consequent of the antecedent denied*. At any rate it is clear that in such cases as those under discussion the failure to prove impossibility which arises from the emptiness of the suggestions themselves must not be taken as amounting to the establishment of real possibility.

Privation and Impossibility.

β. We cannot go from bare denial, or privation, of an impossibility, to real possibility, because *privation* of impossibility does not involve positive affirmation as the *exclusion* of impossibility does. It may seem therefore that we have decided in the negative by anticipation the

question whether privation or bare denial can ever justify exclusion. We denied the claim of privation to establish real possibility, on the ground that it could not exclude, as one form of the ground that it could not affirm. Thus when we omit the incompatibility or impossibility, and consider merely the exclusion of any positive content, it seems that we cannot predicate exclusion on the strength of privation. Up to a certain point common sense and experience support this result. Gold has never been found in Northumberland, but that alone does not prove that it never can be found there, unless the geological formation forbids, i. e. is a positive ground of exclusion.

Still, the two transitions, from privation of impossibility to affirmation of real possibility, and from privation of actuality to exclusion of possibility or of actuality, do not stand on quite the same level. The former is explicitly a passage from denial to affirmation, or, as we saw, from nothing to something. The latter retains its negative form and *vehicle* unchanged, and leaves the change of its *ground* and *bearing*, the two other elements of meaning[1], to be moulded by the context. Any mere denial or privation when expressed intelligibly is given a ground and bearing with reference to our cognitive state, as we saw in dealing with the instance, 'We do not know that there are things in themselves.' What is a bare denial with reference to reality is a positive affirmation about our knowledge. We have agreed that we cannot transform 'We do not know it to be impossible' into 'It is possible.' Can we transform 'We do not know it to exist' into 'It does not exist'?

It is plain, I think, that many beliefs become abortive and cease to be regarded because we become convinced that reality does not constrain us to accept them. And it seems an unworthy shirking of a theoretical difficulty to treat these beliefs as shelved but not denied. If, whether in serious speculation or in grave practical deliberation,

[1] See above, p. 305.

some idea cognate with the matters then before the mind has ceased to exercise the slightest bias on thought or on action, it seems idle to say that upon such an idea we have suspended judgment as upon something that may be true in itself but is nothing for us. It seems clear that upon such an idea—I may instance the Swedenborgian hierarchy of spiritual beings—we have in fact sate in judgment and have condemned it as unreal. But I admit that the speculative expression of our relation to such conceptions meets with serious difficulty from the necessity of basing denial upon a positive ground. On what positive ground can I base a denial that there are exactly seven heavens, or that there are just seven orders of superior spirits? I unquestionably do deny it, that is to say, 'I do not believe it.' The habitual use of such phrases as this [1], which refer grammatically to a fact of my intellectual state, but actually serve as negations of something ascribed to reality, bears witness to the connection which I am attempting to point out.

Incompatibility in the ordinary sense depends on the system of reality. Differents which claim the same place are incompatible, and, in short, everything is incompatible with reality which, while not conforming to our ideal system which stands for reality, is yet without the power to modify it. But, as I pointed out above, all this falls to the ground where the system does not extend. Where 'we do not know' in the sense of having no knowledge—not merely in the sense of lacking complete knowledge—we can say nothing, and *ex nihilo nil.* 'Then,' it may be said, 'neither acceptance *nor rejection*.' I cannot follow this. Knowledge is positive, and acceptance and rejection are not co-ordinate alternatives. We *doubt*, where we have a basis of fact to go upon, and presumptions that appeal to that basis; but where we have nothing to go upon we cannot doubt.

[1] Compare *οὐ φημι*, which means 'I deny,' or our common phrase 'I don't think that'—which is really equivalent to 'I think that—not.'

The only conclusion that I see open to us is of this nature. Where privation seems to warrant exclusion, we must look for the positive ground of exclusion in the determinate completeness of our ideal Reality. Such a ground may be hard to state, and may amount in positive content to little more than our experience of the persistency of the privation. But its nature must be that the ideal Reality *by its organised completeness* excludes the matter which attempts to introduce itself. This must not be taken to mean that we are nearly omniscient. It means that the general plan and growth of our knowledge is such as to afford no basis of attachment for the proposed accretion, although *for this very reason* we are unable to specify any definite antagonism between the content suggested and the positive contents already accepted as part of Reality. Reality is not especially incompatible with seven heavens; it could be so only if we accepted some kind of heaven as a reality and were prepared, on the basis of our knowledge about it, to reject either the particular number seven, or the application of number to such a subject at all. What we really have to say is that we do seem able to trace, however imperfectly, something like a development of the sensuous into the spiritual world; and that the main lines of this development appear to have a completeness of their own, without growing out into a duplicate and quasi-material world.

It is not enough to destroy the grounds on which a suggestion is explicitly based, unless we can show that they form not merely the sole ground alleged, but the sole ground possible. And in a region beyond our knowledge this *ex hypothesi* cannot be done. It is often possible to show by what logical fallacy or by what psychological tendency a suggestion was generated; but this is not a logical refutation. It may however grow into a refutation if, besides the tendency which caused the error, we can exhibit the satisfaction which reality offers to the rational necessity embodied in that tendency. We thus not only

destroy the *raison d'être* of the error, but show a presumption that there is an excluding ground.

Exclusion by Privation then rests on a conviction, won by persistent lack of affirmation, of the *true* negative limit and external contour of knowledge, which limit, *qua* the true limit, must be held true of reality. A privation cannot ultimately be referred to our knowledge only. If persistent in the history of thought and justified by the tendencies of knowledge, it must sooner or later be taken as true of reality.

At best, we must remember, negation is always negative. The last step from the positive ground to its formal expression by means of denial, retains the form of privation, i.e. of ignorance. This is what the old saying means, 'you cannot prove a negative.' The negation is not after all quite the same as the positive opposite latent under the negation. You cannot prove that parallels never meet. In order to do so, you would have, like the Irishman, to 'be there when it did *not* happen.' You can only prove that they always do this, that, or the other which in virtue of your geometrical experience you take as equivalent to not meeting. That is to say, *assuming* your geometrical system to be *ad hoc* exhaustive, then your failure to see, on the basis of that system, how parallels can meet becomes knowledge though it retains the form of ignorance. It expresses a limit or outline essential to geometrical science. Thus the cases of persistent privation and of true positive exclusion (genuine denial, not bare denial) differ simply by the nature of the positive ground which underlies them respectively. In privation this ground is general, drawn from the character and tendencies of Reality; in true exclusion it is special, drawn from a system within which the alleged reality would fall. It would seem fair to concede to the former somewhat more and to the latter somewhat less finality than common theory recognises.

CHAPTER VIII.

Disjunction and the statement of Chances.

The Disjunctive Judgment.

1. The Disjunctive Judgment combines in an explicit form the characteristics of the Generic and of the pure Hypothetical Judgments.

Its Genesis.

i. It is needless however, and would be artificial, to lay down rules for the precise mode of transition from these judgments to the complete Disjunction. The whole assertory state within which the simpler forms of judgment, at any rate from Comparison upwards, have their import, is from the first of a disjunctive nature. Reflection may therefore be stimulated to the explicit formulation of this type of knowledge by very various occasions. But the common ground which must operate in all these occasions is the discovery of differences into each of which the identity underlying all of them enters as a whole, and in all of which taken together its manifestations are exhausted. Every difference has the former of these characters in some point of view. A conjunctive judgment, or conjunction of judgments with an identical subject, can always be made disjunctive by wilful abstraction. A diamond is carbon, and crystalline, and very hard, and highly refractive. This is a conjunctive judgment or set of judgments[1]. But if we limit the underlying identity, the nature of the stone, by the several conditions under which it exhibits these several predicates, then each of these predicates may be regarded as not conjoined with but exclusive of the other attributes enumerated. A diamond may be considered either merely as an element, or merely as a transparent substance exhibiting crystalline structure, or in its power of scratching other hard substances, or in its

[1] See above, chap. i, on the Judgment in Time.

effect upon light. This is disjunction—arbitrary and subjective, if we please, but still disjunction. Any distinguishable attributes may be regarded as reciprocally exclusive by our simply refusing to attend to more than one of them at once. x may be both a and b, but qua a it is not b. But in another respect also the above instance of disjunction is bad and arbitrary. It makes no serious attempt to exhaust the attributes. We stop enumerating them simply because we do not care to go on.

It is clear that a disjunctive judgment may originate with a conjunction of judgments like the above, which turn out to have assignable relations to one another, or, again, with the discovery of an error in a generic judgment; e.g. '*Cereus* is a night-flowering plant.' 'No: *Cereus grandiflorus* is a night-flowering plant, but there are a hundred species of *Cereus*, and not all are night-flowering.' Such considerations would force upon us the disjunction, 'Cereus blossoms either at night, or in the early morning, or etc., etc.' Again, the attempt to convert a generic judgment naturally leads to a disjunction[1]. And so does the challenge thrown down by the specific condition and consequent of a pure hypothetical judgment. 'If we catch the train this morning we reach London to-night.' In presence of such an assertion it is not in human nature to abstain from asking, 'And if we miss the train, what then?' so as to make explicit the disjunction, 'We either catch the train or miss it;' and probably some such further consequence as, 'We either get to London to-night, or have to sleep at Crewe.'

All these are merely different ways of giving utterance to the interest which attaches to some pervading identity and compels us to pursue it throughout its modifications. Such an interest, as we have seen, environs every genuine judgment, and makes it an element in a system. And in proportion as such a system is made explicit, negation enters into knowledge. For in every system the parts have an aspect of negative relation to one another.

[1] See above, chap. vii, on the Conversion of generic judgments.

Thus the immediate occasion on which we form a disjunctive judgment may vary. But the characteristics of true disjunction do not vary. By true disjunction I mean a judgment in which alternatives falling under a single identity are enumerated, and are known in virtue of some pervading principle to be reciprocally exclusive, and to be exhaustive. This is the disjunction of which I shall treat, being convinced that what seem to be different kinds of it are in fact nothing but imperfect examples.

Imperfect Disjunctions.

ii. I will mention three of these.

Not exclusive.

a. First, there is the so-called disjunction in which the alternatives are exhaustively enumerated, but are not taken to exclude one another. 'He is either knave or fool' does not, it is said, exclude the possibility that he may be both. On the question of the genuineness of these disjunctions I must refer to Mr. Bradley's detailed discussion[1], which appears to me to show decisively that we never *really* mean to take into consideration under our judgment the conjunction of the alternatives specified in our 'Either'—'or.' Without following him into the study of grammatical details, I content myself with remarking that any Disjunction in which the alternatives are not reciprocally exclusive must of necessity fail to be exhaustive—the case or cases in which any of them are conjoined being *casus omissi*. If, for the purpose of the disjunction, such a case may be reckoned under one of the other alternatives, then indeed the disjunction may be reckoned to be perfect; but then the case of conjunction does not rank *as* conjunction, but under one or other of its component elements. Thus, 'To go by train you must have either a first, second, or third class ticket.' A man may of course buy all three, if he pleases; but the possession of them does not constitute a fourth case of liberty to go by the train. He goes by the train in virtue of one or other, though he may change carriages at every station if it amuses him. The conjunction of all

[1] Principles of Logic, Book I. chap. iv.

three tickets forms no separate alternative as a particular way of going by train, and therefore is rightly disregarded in the disjunction. It is not indeed implied that 'If he has a first-class ticket he has not a second or third,' but it is implied that 'If he goes in virtue of a first-class ticket he does not go in virtue of a second or third.'

Disjunctions of Ignorance.

β. Secondly, there are the troublesome cases often taken as the true instances of Disjunction, which may be called 'Disjunctions of ignorance.' The essence of these is that they refer to an individual (actual or supposed) and not to an individuality, and consequently express doubt or indecision rather than knowledge.

'A triangle is either isosceles, scalene, or equilateral.' A triangle here *can* mean any individual triangle you may pitch upon—'any given triangle.' And with respect to such an individual triangle the disjunction says that it must belong to one of the three kinds mentioned, but that we do not know to which. Lotze, for instance, appears to accept this expression of indecision as the final type of disjunction. But it seems obvious that this uncertainty is purely dramatic or fictitious, and is a mere corollary from the true disjunction, which is, 'A three-sided plane figure as such must have all its sides equal, or two only equal, or all unequal.' Or we may take a case where the doubt is real, as often in common life; but here also it is a mere application of or inference from the true disjunction of knowledge. 'Being an Oxford man, he is either a University College man or a Balliol man, or etc.' This judgment, which is a real expression of doubt or ignorance, is based of course on the positive knowledge that the conditions of University life require the student as such (generically) to attach himself to some one of the corporate bodies enumerated in the judgment. With disjunctions of this type we must class the commonest of all expressions of doubt or ignorance. 'He is either angry or jealous,' 'He has either measles or scarlet fever.' These, like the above, differ not in principle but only in perfection from the

ideal disjunction. What operates is something we know, and know to contain the specified alternatives. We do not however specify our knowledge in detail—it may consist in a content hard to define—and we merely point to the concrete individual, in whom it is embodied and from whom it takes its interest. About this individual, as his complete state goes beyond our knowledge, the judgment takes the shape of doubt, just as in the case of 'any given triangle.' The higher logical form may be imposed on the lower content; this is a possibility which follows from the nature of reason, and which makes abstract distinction appear in some aspects so valueless. Every thinkable content has in miniature all the characteristics of reason, and in the abstract you can hardly say anything of the self-conscious mind which is not also true of a protococcus or of a pebble. The precise modes and degrees in which the content fulfils the spirit of its abstract form are what we must keep our eyes on in a true concrete science. I cannot admit then that the mere inference from our disjunctive knowledge respecting that which an individuality implies, to a doubt respecting a given or supposed individual, has a claim to rank as a genuine species of disjunction.

Disjunctions referred to point of time.

γ. It is a similar vice to account for the exclusiveness of a disjunction by referring it to a point of time. No judgment whatever refers to an atomic point of time; and no universal judgment refers to any time except that implied in the content of the judgment itself. The time at which the predication happens to be made has nothing to do with the import of any judgment except in as far as it is taken into the content by reference direct or indirect to present perception[1]. The denial of coexistence in time, which appears in *some* disjunctions to be the principal meaning, is a corollary from the nature of the disjoined contents, not a result of the present tense employed as a vehicle of predication. 'A railway signal shows to the same side either

[1] See above, chap. v, on Time in singular judgments.

a red, or a green, or a white light.' Now of course this judgment informs us that at any given moment of time we shall only see one of the three lights. But to interpret the judgment as if it essentially referred either to the moment at which it is made or to 'any given moment' is a fallacy on all-fours with that pointed out above of interpreting 'The triangle' as = 'any given triangle.' The judgment means that the nature of a railway signal is to show one light to the exclusion of another and the other to the exclusion of the one. From the nature of the case they exclude one another in time and in spatial direction. But the present of predication is coextensive, in its reference, with the *nature of the signal*, and does not refer especially or exclusively to the moment at which the judgment happens to be pronounced, nor even hypothetically to 'any given moment.'

We must clear out of the way, then, the above disjunctions of ignorance, or dramatic disjunctions, and consider exclusively the perfect disjunction as a form of knowledge. One more peculiar type, indeed, will come before us later as the statement of chances.

Logical affiliation of true Disjunction.

iii. A true or ideal disjunction is a generic judgment whose content is developed or inter-related by the aid of hypotheticals.

The Generic Judgment.

a. It is a generic judgment because it deals with an individuality, a content which is a whole or system in itself. So far, like the generic judgment, it is quasi-categorical. The subject is such as can be real, and the judgment assumes its reality. But the predication made of this real and quasi-individual subject is peculiar, and has points of analogy both with the negative and with the pure hypothetical judgment. The individuality is exhibited in the different forms which it is capable of assuming as a whole, and which consequently it cannot unite in itself under a single set of conditions. If the individuality is considered as essentially affected by time, these forms may be successive; if it is a generic or specific character, they

may coexist in space and time with each other; all that is necessary is that the subject-content should enter as a whole into each of the enumerated forms. What, then, is directly predicated of the subject-content? I see no theoretical reason to deny that the 'either—or' considered as the articulate analysis of a universal[1] system of attributes can be intelligibly and categorically predicated of it. Every predication includes differences, and an extended present, and therefore predicates as facts elements which can be regarded as reciprocally exclusive. In fact, every universal is a synthesis of such elements. But undoubtedly there will always be positive qualities which are the condensed or summarised expression of the total analysis, and may present themselves as its ground, being thus in disjunction as the positive ground or bearing in negation, and as the underlying quality in the hypothetical judgment. 'The triangle is either scalene, isosceles, or equilateral' contains as this condensed relation, or synthesis of differences, 'a plane figure bounded by three sides, which may have any relative length so long as any two of them are together greater than the third.' Such an attribute might be called the categorical or positive basis of the disjunction; but it is an illusion to suppose that a basis or ground is *necessarily* more real or more primary than its consequences, and that therefore the implied predication in disjunction is more categorical than the explicit 'either—or.' The ground is to its consequences as whole to part; but if the consequences are fully stated in a connected system this distinction falls away, and in disjunction such full statement is the ideal.

The disjunction is therefore the only judgment-form that in strict theory can stand alone. All connection is within a system; and only that judgment is self-sufficing which affirms at once the system and the connections within it. I do not say that every disjunction is thus

[1] 'Universal' not in the sense of abstract or generalised, but in the sense of a concrete identity containing differences.

ultimately self-dependent, but relatively to a number of hypotheticals which have their truth within it every true disjunction has a substantive character. Thus the disjunction which lays down the nature and kinds of the triangle contains the ground and basis of all the hypothetical judgments which expound the properties of that figure. In other words, if completed and made explicit, any one of those hypotheticals would result in that disjunction; which however itself falls within the ultimate judgment that would expound the nature and modes of space. The above then is the generic or substantive element in disjunction.

The Hypothetical Judgment.

β. But we need in addition the reciprocal relations between the forms which constitute the explicit development of this predicated universal. For these relations we must go to the hypothetical judgment, and to the hypothetical in a very late and artificial form, viz. that in which the negation of one content is known as the ground of the affirmation of another content, and the affirmation of the one content is known as the ground of the negation of the other content. The perception of the relations which these two types of hypothetical judgment embody is essential to the exhaustiveness of the disjunction and to the reciprocal exclusiveness of its members. In order to know that the alternatives enumerated are reciprocally exclusive, we must be able to say (using as an illustration the simplest case in which there are only the two alternatives B and C), 'If A is B, it is not C.' And in order to be sure that no possible alternative is omitted we must be able to say (in the same example) that 'if A is not B, it is C.' According to a rule of Conversion, or rather of Inference, accepted for the case of Hypothetical Judgments ('Deny the consequent') the equivalent or converse judgments, 'If A is C it is not B' and 'if A is not C it is B' are involved in the two corresponding judgments above mentioned. If this Conversion or Inference is disputed, then we must say that all four cases, 'If A is B—,' 'If A is C—,' 'If A is not B—,' 'If A

is not C—,' must be perceived independently before the predication of disjoined alternatives is justifiable [1].

[1] I insert here some details which are legitimate matter of curiosity, but would needlessly overload the text.

i. It might be urged, on the analogy of the argument employed above (p. 342)—that a disjunction which is thoroughly exhaustive cannot but have its members reciprocally exclusive—that the hypothetical which *prima facie* secures exhaustiveness (If A is not B it is C) ought to affirm the *reciprocal* exclusiveness of the antecedent and consequent, i. e. to exclude the case B C. If it did so, on the other hand, it would become at a blow equal to the disjunction 'A is either B or C,' and would include in itself the case 'If A is B'—with its converse. In other words, it would become a *reciprocal* judgment, correlative to a definitory affirmation, and as such would admit of conversion or inference *by denial of the antecedent*; just as if we were to infer from 'A is B' that 'not-A is not-B.' This, as we have seen all through, is the ideal of the judgment; and a hypothetical judgment with negative condition or negative consequent, that fulfils this ideal, coincides already with the disjunction. But usage does not warrant the ascription to the hypothetical 'If A is not B it is C' of the meaning 'If A is not B-without-C it is C-without-B.' As commonly employed, therefore, it lays down a certain outer limit, but does not exhaust the subdivisions within the limit. This is just the point of contrast between the hypothetical judgment in its ordinary signification and the complete disjunction. But there is a certain tendency on the part of the former to advance towards the latter. It is plain that the reasons which induce us to give prominence to the alternatives mentioned as the only ones to be specially considered may readily transform themselves into reasons why only the alternatives mentioned *can* be considered, or, perhaps, can exist. We have such reasons *just* warranting a disjunction in the instance given above (p. 342), where the case formed by the combination of the alternatives considered exists, so to speak, in fact but not for the law.

ii. It may be worth while to point out that disjunctions with more than two alternatives must be treated, as regards the hypothetical judgments involved, as a succession of dichotomies. The hypothetical judgments of each type involved in such a disjunction would therefore be equal in number to the disjoined members, i. e. each alternative must be made in turn the positive and negative condition of an hypothesis, with a compound consequent, the disjunctive nature of which cannot appear in the hypothetical judgment. A is either B, C, D, or E. Then we have the negative conditions, 'If A is not B, it is within C D E;' 'If A is not C, it is within B D E;' 'If A is not D, it is within C B E;' 'If A is not E, it is within C B D.' The positive conditions will correspond severally to the above negative conditions.

Here we see a second defect of the hypothetical as compared to the disjunctive judgment. It can only handle one reciprocal relation at a time, and cannot master a whole system of such relations in a single view. In the above analysis the hypothetical judgment does not enable me to express more than a single contradictory relation, as between a particular A and its not-A. The idea of a pervading contradictory relation, characterising *any* one part as against all the others, cannot be expressed in any one hypothetical judgment. By saying

The reference to these two or four hypothetical judgments has its value in elucidating the nature of the system which a true disjunction embodies. It exhibits in the plainest light the indispensable function of negation in articulated knowledge, and the positive import with which in virtue of that function the negative is invested. We have already seen the nature of this import in the analysis of the significant negation, where, however, the positive ground and consequence of denial were matters of tacit understanding and inference from context. In explicit disjunction, on the other hand, we find them after they have been developed independently and distinctly in the hypothetical judgment, and affirmed as actual attributes within a system that is alleged to exist in reality.

When are parts disjunctively related?

iv. But, it may reasonably be objected, it is not in every system that the parts are disjunctively related. As a rule the parts of a system are predicable in conjunction and not in disjunction.

Apart from the case of intentional abstraction by which any conjunction can be turned into a disjunction—for *in the last resort* within every system every part involves the whole nature of the system—this criticism is just. A human body is made up of trunk, limbs, and head; not of *either* trunk *or* limbs *or* head. The government of a civilised nation consists of the legislative *and* the executive power, not of the legislative *or* the executive. A genus, again, may be said to be identifiable with *all* its species, not merely with *either* this *or* that, though here we are on more doubtful ground. Triangles are isosceles, scalene, *and* equilateral. Men are white, black, *and* yellow. We could hardly say however that '*the triangle is* isosceles, scalene, and equilateral,' or that 'man is white, black, and yellow.' The difference between conjunctions of the kind here brought forward, and true *dis*junctions, is formally speaking a difference of the aspect in which a real system is regarded, but

'If A is not B, it is *either* C, D, *or* F' we should be pressing the hypothetical type beyond its powers.

materially, therefore, has an intimate dependence on the actual nature of the real system in question, which may be such as to throw one aspect or another prominently forward. Every universal may have its differences conjunctively enumerated, whether they are in time or in space, or merely distinct in thought. But in so far as the universal itself enters as a whole into each difference, which it can do in very different degrees, so far each difference, if imposed as a condition on the universal, excludes all the other differences. A man's having a hand does not interfere with his having a foot. But a man's having a feeling in his hand does begin to make a claim on the universal, the man himself, which is to a certain limited extent incompatible with his having a feeling in his foot or elsewhere. And when we come to consider such acute interest or feeling as occasions the absorption of the whole mind in the perceiving or suffering member, then it is true to say, 'The man perceives or feels *either* with eye *or* with ear *or* hand *or* foot,' as the case may be. So again if we think of a triangle as a mere abstract generality that describes a heap of various figures, we may say that it includes, or that—in a collective judgment—its individual instances *are*, this, that, and the other. But if we think of it according to its complete conception as an individuality that must necessarily take individual shape, and if we follow the process by which such shape must be determined, then we can only express our insight by the use of the disjunctive 'Either—or.'

The conception of the whole as conditioned by one of its parts takes the place of that imaginary reference to an atomic point of time which has been supposed to be of the essence of disjunction. 'A moving object is either here or there' means 'if here, not there' and 'if not here, then there.' It does not mean 'Within the indivisible moment in which I am judging a moving object can be in one place only.' For I cannot judge in an indivisible moment, nor can I refer to a present that is an indivisible moment. In any extended time a moving object traverses space, and

our 'present' is always an extended time. And so the disjunction if referred to our 'present' time would not be true, and the moving object would be, like Sir Boyle Roche's bird, 'in two places at once.'

Is the disjunction reducible to Hypotheticals?

v. When we have understood the nature of disjunction there is not much profit in asking whether the disjunctive judgment can be 'reduced' to two or more hypothetical judgments. The mere fact that the hypotheticals in question[1] are separate judgments, and that the disjunction is a single judgment, is enough to show that we have in the latter a *combination* of unity with reciprocal exclusion which we have not in the former. I have endeavoured to express this unity y repres enting th e disjunction as a combination of the generic and the hypothetical judgments. But it must be remembered that at best we are dealing with grammatical types which are only the symbols of states of knowledge; and it is most probable that any one who is able to make the two complementary hypothetical judgments 'If A is B it is not C' and 'If A is not B it is C,' supplies out of his own mind the systematic relation which the two taken together involve, in a judgment equivalent to 'A is either B or C.'

Not to dwell longer than I can help on formal points, I merely remark in addition to what was said above[2], that in any case these hypotheticals themselves presuppose *the* ultimate or formal disjunction, 'A is either B or not-B,' by their introduction of a negative relation into knowledge; and that further, if we wish to take the two hypotheticals above mentioned as implying the two which follow from them by denying the consequent, we are once more relying on this formal disjunction, which is essentially involved in such a transition[3]. The material importance of the whole question lies in the process by which the *form* of disjunction, in itself on a level with or consisting in the Law of

[1] See foot-note, p. 348. [2] p. 348.

[3] See the account of Contraposition, above, chap. vii: the process by 'denying the consequent' is essentially the same with this.

Excluded Middle, i.e. of contradictory opposition [1], acquires the material significance of Disjunction between positive contraries. I have tried to show above that these two elements, the bare rejection and the positive contrary, are probably to be regarded as distinguishable from the first, but as tending to coalesce, and not as later and earlier phases respectively of the same movement. Or if, in history, earlier and later, then the later, the abstract formal negation or bare rejection, is to the earlier, the actual choice between positive alternatives, as a separable outgrowth which consciously reunites with it in the region of reflective intelligence. No anthropological doctrine can affect—though it may elucidate—the above logical analysis of the relation between the negative and its material import as made explicit in the judgment.

The statement of Chances. Limits of the problem in present work.

2. The statement of chances is a case of the Disjunctive Judgment.

i. The title which I place at the head of this section indicates the limits of the question which I propose to treat in it. The calculus of chances, like all mathematical reasoning, has at its root an inference that can be expressed in ordinary language. In treating of inference it will be incumbent upon us to discuss the differentia which separates calculation from ordinary reasoning; and we shall find the outward and visible sign of this differentia to consist in the enormous abbreviation of reasoning processes by their condensation into the import of recognised symbols. It is a further question in virtue of what peculiar nature an inferential process can submit to such an abbreviation, and also to what extent the abbreviation has the effect of substituting something else, e. g. application of a rule-of-thumb [2], for the reasoning process so 'abbreviated.' But the value

[1] It is an unlucky confusion that the so-called law of Contradiction only explains Contrary opposition, and that it is the law of Excluded Middle that lays down the principle of Contradictory opposition. See Bk. II. chap. vii.

[2] I have in my mind as an instance the use of tables of logarithms. It does not appear formally essential that any one who uses them should understand the reason of the rules he applies, i. e. (I presume) the nature of Indices.

of any such abbreviation must ultimately rest in a logical sense upon the reasoning which it represents, and this reasoning must be in its nature explicable in language like any other reasoning[1]. Thus in the calculus of probabilities, though I am obliged from mathematical incompetence to omit much that might be of interest to an expert even from a logical point of view, yet the principle of the statement of chances is not a matter of technical method, but of fundamental postulates of knowledge. And also, no doubt, it illustrates the necessity by which totalities of a certain degree and kind of abstraction become subject to numerical manipulation.

Affiliation of abstract disjunction.

ii. The statement of chances rests upon a species of disjunctive judgment, but not on what we have spoken of as the true or real disjunction—which might also be called, in contrast with that which we are about to discuss, the concrete disjunction. The concrete disjunction, in as far as it reaches its ideal, embodies differences that are distinct and individual modifications of the underlying system, and provides in the nature of the common subject a complete account of the conditions which determine it to each of these differences. In using such a disjunction we know precisely how and why the whole or real subject must enter into each of the differences which constitute it. And though it may be said that we do not or need not know when or how far each *condition* involved is or can be *real*, yet we must know something of the relation of such conditions to the reality of the system which they affect (because their reality is partly relative to its reality), and at least there is no sort of reason for supposing that the reality of these known conditions is to be taken as an equal amount in the case of all the several alternatives. The variety of the

[1] A *practical* reservation must here be made in considering the higher mathematical processes from this point of view, because they may presuppose a number of stages consisting of subordinate processes, and be inexplicable apart from these latter. But to explain the whole complication in ordinary language might involve a lengthiness that would make it harder to follow such an explanation than to master the proper mathematical language.

world and of all reality throws the whole presumption the other way. The idea of equally grounded alternatives is a negative idea, and can only exist by a defect of knowledge, or by an abstraction from what we know.

The abstract disjunction, on which alone a statement of chances can be based, cannot be a system of alternatives whose conditions and relations are thoroughly understood. It is rather allied to what was spoken of above as the disjunction of ignorance. The affiliation to the hypothetical judgment is indeed the same in all disjunctions that are formally perfect, i. e. both exclusive and exhaustive. But on its other side the abstract disjunction does not, like the concrete, descend from the generic judgment with its penetrating and dominating individuality, but rather from a judgment of enumeration such as the collective judgment, with its homogeneous parts which do not occupy individual or distinctive relations to the containing identity. It is true that to give meaning to any disjunction, or to a statement of chances founded upon it, the parts or members of the whole must be distinct as well as homogeneous. But the distinction is in this case mere distinction, interesting as a result, like the differences between the six sides of a die, but on the side of its relation to the whole not rooted in any known modifications of that whole. In other words, the *number* of parts, or the fact that each is *one among so many*, is the primary fact, and their *nature* is secondary. We may illustrate this by contrasting an example of a concrete with one of an abstract disjunction. 'The constitution of a modern nation,' it may be said, 'is necessarily either democratic or plutocratic.' Here the fact that the species assigned are two in number is of no importance. No one would think of trying to infer anything from it as to how many nations were likely to be democratic and how many to be plutocratic. The whole weight of the judgment rests upon the component elements implied in 'modern nation,' and upon the development of those elements which the judgment indicates to be necessary.

But if we take such a judgment as 'A die must turn up one of its six sides' we here regard the individuality of the several sides as indifferent with respect to the probability of their recurrence, though not with respect to its results. The important matter is the *number* of the alternatives. For either we are unable to estimate the operative causes which determine one alternative rather than another, or we wilfully abstract our attention from them for the sake of falling back on a more general process of estimation. We are to suppose then that as the basis of our statement of chances, we have before us such a formal disjunction as the above, closely akin to the judgments which arise in the process of enumeration, but with the addition of those known relations between the enumerated parts which are embodied in the hypothetical judgments with negative antecedent and consequent respectively.

Essence of the statement of chances.

iii. We are then in a position to enter upon a process which I can only describe as taking stock of our knowledge by arithmetical methods. We know that the die has six sides and no more, and that as the result of a single throw it must turn up one of them. We know that we do not know of any cause operative in the nature of the die or in the conditions of the throw that should favour any particular side, nor of any grounded presumption whatever in favour of any one side in particular. In the case of the die, which herein differs from many cases of the statement of chances, we may say that we *know that there is not* any permanent operative cause either in or outside the die that can favour one event in particular. Therefore—and here is the all-important step which really constitutes the statement of chances—we go from 'no known inequality of the grounds for affirmation[1]' to 'equality, *so far as follows from this knowledge*, of the grounds for affirmation' of the several

[1] Judgment about the future, *if* we judge, is of course affirmation as much as judgment about the past. But it is not essential to the statement of chances to refer to the future. They can be stated on given premises about any event, although its real issue be known.

alternatives. Having made this step, i.e. having placed the grounds for each alternative on a level as equal, we are of course free to treat them as units, and a ratio expressing the relation of each to all follows as a matter of course. Each alternative counts for one, and none for more than one. In other words, the ground for the affirmation of each, assuming the reality of the common subject, is represented by a fraction of which 1 is the numerator and the total number of alternatives the denominator. We do not attempt to say what the ground is, but we say that, by the terms of the disjunction, it is one out of so many equal and reciprocally exclusive grounds. This transition from indifference of formulated knowledge to equality of grounded affirmation, and so to the relation of units within a sum total or fractional parts within unity, is the logical foundation on which the statement of chances rests.

Applications of the statement as calculus. Alternatives and Results.

iv. All its developments are applications of this principle. *a*. For instance, it may happen that alternatives which are separate units in respect of the ground for affirming their reality are identical in respect of that result of which the chances are being stated. It follows that the chances of this result are represented by as many units out of the sum total as there are equal alternatives which produce it. In other words, the chances of the common consequence of a number of alternatives whose chances are known is the sum of the chances of those alternatives. If you bet with me that you will throw a six first throw with a single die, then all five alternatives from one to five inclusive have annexed to them the consequence that I win the bet. The total number of alternatives being six, I have thus $\frac{5}{6}$ of the chances in my favour, or the chances against you are 5 to 1.

The further processes of the calculus must always reduce themselves to obtaining a correct enumeration of the equal alternatives, and a correct estimate of the number of those equal alternatives which have annexed to them the result whose chances are to be stated.

Physical alternatives.

β. The combined chances of independent events illustrate both these principles very simply.

To find the physically different throws that are possible with *two* dice, we must take into account which is which of the two dice. It is obviously possible in a single throw for any side of the one die to concur with any particular side of the other die, i. e. writing down the six sides of the one die as headings, you will have to write down all six sides of the other as possible cases under each of these headings. This relation is of course expressed numerically by multiplying the whole number of sides of one die by the whole number of those of the other: $6 \times 6 = 36$. This gives the correct enumeration of the alternatives that are physically possible, the chance of each in case of a single throw being $\frac{1}{36}$. Generalising this process, we may say that in two or more independent sets of alternatives the chance of the concurrence of two or more particular events, as many as there are sets concerned, is determined by the product of the numbers of alternatives forming each separate set multiplied together. That is to say, the chance of any particular concurrence of events, consisting of one out of each independent set, is 1 divided by the product in question.

Interesting results.

γ. But to return to the example of the two dice, it may be that the 36 possible concurrences would not all count as different, because e. g. the throw 2 with the die *a* and 1 with the die *b* may be treated as the same with the throw 1 with *a* and 2 with *b*. Therefore the results which are the alternatives according to this mode of counting have not all of them the same chances in their favour, i. e. do not severally contain the same number of physically distinct alternatives. Each of the six throws 1 and 1, 2 and 2 &c. up to double sixes inclusive corresponds to one physical alternative only out of the possible 36, and therefore has only the chance represented by $\frac{1}{36}$. On the other hand, each of the fifteen 'throws' 1 and 2, 1 and 3 to 1 and 6 inclusive, 2 and 3, 2 and 4 &c. to 5 and 6 inclusive, is a result annexed to two physical alternatives

(1 and 2 or 2 and 1, &c.), and therefore counts as two equal cases or units, and has a chance represented by the sum of the chances of these equal cases, viz. by $\frac{2}{36}$ instead of $\frac{1}{36}$. These 15 'throws' then, answering to two actual alternatives apiece, exhaust the 30 real cases that remain after deducting the six doublets, and the whole 36 alternatives are thus accounted for. Or again, if we take into account merely the number of points thrown at each throw, without regard to their distribution between the two dice, we get six combinations of throws that will give seven points, five for eight points and six points respectively, and so on to one combination for two points and twelve points respectively. The chances of throwing 7 are therefore $\frac{6}{36}$, and of throwing the other numbers $\frac{5}{36}$, $\frac{4}{36}$, and so on down to $\frac{1}{36}$ respectively.

What does statement of chances represent?

v. Logicians are not agreed as to the proper description of that which is expressed by the ratio that embodies a statement of chances. Their disagreement arises more from the subtlety of the distinctions involved, which makes description difficult, than from a substantial difference of opinion as to the relation between reality and the cognitive act in question. It is not unnatural, for example, to say that the ratio expresses our subjective expectation. But this is an obvious slip, because the whole process of the statement is undertaken in order to correct and control our subjective expectation, and is futile unless it does so. The complete counterpart of this idea would consist in maintaining that the ratio expressed an actual behaviour on the part of real things. I do not know that this suggestion has ever been made in this extreme form. Something of the same kind however is commonly believed with respect to the realisation of chances in a series, which I shall speak of directly.

The ratio of chance seems really to express the amount of ground, *which is afforded by the knowledge formulated in the disjunctive basis of the calculation*, for affirming the reality of the result whose chances are in question, on the assumption that the general case, which forms the subject,

is realised. Instead of 'amount of ground' it would be more usual to say 'degree of probability.' And by avoiding the expression probability we do not really escape the tautology which it would introduce. For the idea of a measurable amount of logical ground, like the idea of a measurable degree of probability, is only intelligible with reference to the statement of chances.

'Expectation' sounds more like a term which might elucidate the definition, and if we say that the statement of chances represents *the expectation which is justified by the premise*, we might not be far wrong. But I do not feel sure that anything can be meant by a degree of expectation except the mood, whatever that may be, which is founded upon a statement of chances. So that the chance would not come from measuring the expectation, but the expectation from measuring the chance. Even if we identify expectation with judgment—a proceeding which is more than doubtful—we cannot say that the chances necessarily represent the degree of certainty with which we judge in a statement of chances; because the statement, giving due numerical weight to every equally-grounded alternative, asserts in the proper ratio the reality of *all* the alternatives, and is in this aspect a judgment with its conditions made fully explicit, and therefore necessary or apodeictic. Not that a statement of chances is usually or ever true in fact; but this divergence from fact, or abstract character, affects the categorical aspect of the whole disjunctive basis of the statement, the truth of which basis is in no way affirmed or impeached by the ratio of chance founded upon it. The chance that one side of a 6-sided die will turn up is $\frac{1}{6}$; but this says nothing about the certainty that there is a 6-sided die. Paradoxically enough, the statement of chances seems to measure, if anything, the degree of certainty of a problematic judgment made without knowledge of or in abstraction from the statement, as to the probability of a single alternative out of a number without reference to the remaining alternatives. Not that a statement of chances

can govern the meaning of a judgment made in ignorance of it, and it is indeed hard to see any meaning in degree of certainty apart from measurement by the enumeration which gives a ratio. But on the other hand, the moment we have the ratio, we have with it the *whole* consequence of the assumed reality, and the judgment which asserts the ratio is mere arithmetical necessity, the nature of the assumed reality being given. The judgment that 'the odds against any one side of a (6-sided) die turning up at one throw are 5 to 1' has not a probability as 5 to 1, but on the premises is necessary. But it determines what I *ought* to mean, when I say, in ignorance of or not considering the calculation, 'it is unlikely that a six will turn up the first throw.' If I reflect and say, 'It is unlikely (with an unlikelihood of 5 to 1) that etc.,' then my judgment has ceased to be problematic, and has become necessary, i. e. the conditions of its probability are analysed and made explicit. Thus probability as a character of judgment disappears when measured.

The ratio of chance then expresses the amount of ground for affirming, that follows from the knowledge formulated as the disjunctive basis of the reckoning. We may possess knowledge that does not conform to the conditions of the statement of chances, or at least that is not relevant to the special disjunction which we are able to employ. Such knowledge may cause us to distrust the reckoning slightly or wholly as it affects some particular case. I may think for instance that the calculated risk of being run down by a cab in the streets of London does not apply to one man who is in the prime of life and habitually alert, or to another who is bedridden and never goes into the streets at all. But none the less the probability of cab accidents for each individual of the population *on the data that are taken* is a mere question of calculation and can only have one correct answer. My private notion that I have supplementary data which ought to be considered, or that a more careful distinction should be made between classes of per-

sons in the data, does not in the least affect the probability which flows from the premises in any particular calculation.

The calculus of chances, in short, bears the character of the judgments from which it is derived. Like the pure hypothetical judgment, and the greater part of the abstract judgments derived from the judgment of enumeration, it affirms of Reality indirectly and conditionally. Its truth is a truth of necessity, a consequence that follows from a selected or fancied character when taken as real. Such a consequence is not subjective or arbitrary. Given the premises, it can only be drawn in one way, and every other result from those premises is wrong. But yet it does not express actual concrete fact. It expresses a truth necessitated by the nature of Reality, but not as it stands embodying a fact of Reality. It is simply an arithmetical consequence of a highly abstract disjunctive enumeration.

Chance and actual series.

vi. In every statement of chances we admit our partial ignorance. If this were not so, the statement would involve a flat contradiction. For our grounds for affirming reality are equal in the case of all the alternatives, and yet our statement of chances is based on the assumption that only one of them can be realised.

Fallacies relating to series.

a. But if we do not bear in mind the proportion of ignorance which enters into our data, we are tempted into two fallacious attitudes.

In the first place, we consider ourselves justified in being astonished at the realisation of the alternative which has very few chances in its favour.

And in the second place, we palliate the apparent contradiction between equal grounds for reality and unequal realisation by affirming that the statement of chances has genuine truth only in an actual series which realises all the equal alternatives equally. To realise all the equal alternatives equally is of course the same thing as to realise all the interesting results [1] in the ratio prescribed by the statement of chances.

[1] See above, p. 357.

First, then, we have very small ground for being surprised at the actual occurrence of that alternative which had fewest chances in its favour; and absolutely none for being surprised at the occurrence of a marked or interesting alternative which has against it enormous odds, but only the same as against every alternative which can possibly occur. In the former case we are cherishing a private presumption that the knowledge embodied in our premises represented the actual operative causes which determined the realisation of one or another alternative, and this is *ex hypothesi* not the fact. In the latter case we are misled by a special interest into comparing, as if they were cases of which the chances should be equal, cases which are not 'equal alternatives,' but 'interesting results' comprising unequal numbers of equal alternatives, viz. on the one side a single case which is in some way remarkable, e.g. a hand at whist consisting solely of trumps, and on the other side all other possible hands whatever, which we implicitly contrast, as a single case, with the opposite 'interesting result.' We are therefore surprised at the immense adverse odds in spite of which this result has been realised, not reflecting that there are precisely the same adverse odds against any one of the alternatives which occur in everyday experience, though not, of course, against all of them together.

And secondly, the realisation of the ideal alternatives in a series of real cases is confessedly a fiction unless we stop the series at an arbitrary limit—say, for instance, the actual limit of individual objects or events in question in space or time—and even within this limit the series is not what we want.

There are under this head of an actual series two possibilities which *prima facie* at least must be distinguished. We may have to deal with a natural or deductive cycle of alternatives, or with an arbitrary or inductive cycle.

In what may be called a natural cycle the alternatives are ideal cases that follow obviously from the nature of the

general subject; and are distinct from the real cases, the actual instances or events, which may or may not continue to present themselves beyond the one real case which is postulated in the statement of chances. The sides of a die or of a coin furnish ideal cases; the throws of a die or tosses of a coin are real cases. The natural cycle is the lowest number of actual events in which the ideal alternatives could be all realised equally; i. e. six throws in the case of the die, two tosses in the case of the coin. Beyond this natural cycle there is nothing to suggest a limit to the series of real cases. We have therefore to ask, in considering the verification of natural cycles by experience, whether the real cases correspond to ideal cases (i) within every natural cycle that is observed; and (ii) in the series as a whole continued without limit.

In what, on the other hand, may be called an arbitrary cycle the 'ideal alternatives' are derived from the enumeration of real cases. The population of Great Britain at a given date would be such a collection of real cases, and that these real cases are identical with the equal ideal alternatives is shown by the fact that their number forms the denominator in the fraction that states the chances. If e. g. the population were 30,000,000, and 600,000 people died in the year, the chance, assuming constancy of the average [1], that any one individual taken at random would die within the following year would be $\frac{600000}{30000000}$, viz. $\frac{1}{50}$. The analysis of such a statement of chances appears to me not quite simple, and I doubt whether Mr. Venn, in maintaining that chance essentially refers to series, has identified its elements rightly. The individual human beings composing the population in question, in whatever order we choose to take them (say, in the accidental order of our enumeration), must correspond, I think, both to the

[1] Or following what was said above of the independence of calculation and real event, we may neglect the constancy of averages, and say, referring to the same year for which the enumeration is taken, 'the chance that any particular individual will have died in that year.' On the same premises, the chance is the same after the event as before it.

real case[1]—the throw of a die or toss of a coin—and also to the ideal cases—to the sides[2] of the die or of the coin considered as possible alternatives. And the two general cases of dying or not dying within the year cannot I think correspond to the equal ideal cases or possible alternatives, but must be treated as those combinations of alternatives which arise when several possible 'ways in which the event may happen' have an identical consequence in which we are interested. Or, in short, we might put it thus, following in part Mr. Venn's interesting discussion:—English humanity is the 'event'; each individual is 'a way in which the event may happen[3];' dying and not-dying or male and female[4] are general consequences or results each of which emerges from a large number of 'ways in which the event may happen.' Thus, as is right in theory, the ratio of chances is determined by the number of ways in which the event may happen, which in these arbitrary cycles = the number of cases in which the event does happen. It is a consequence of the inductive character of the cycle that this number of ways has no obvious and necessary meaning, but is a mere inference from the number of times that the event does happen. It is as if there was a die of unknown structure thrown 30,000,000 times, and exhibiting a white side 29,400,000 times and a black side 600,000 times. If then we chose to assume that we had before us a die with 600,000 black sides and 29,400,000 white sides, and to estimate all further chances on that basis, we should be in an analogous position to that which we adopt when we calculate chance

[1] This is what Mr. Venn describes (Logic of Chance, chap. i. sect. 6; chap. iii. sect. 33), in the ordinary language of the theory, as the 'event,' and in his own language as the collection of attributes.

[2] This is what Mr. Venn describes either as 'a way in which the event may happen,' or as the 'occasional attribute.'

[3] Or a particular modification of the collection of attributes by occasional attributes.

[4] Mr. Venn, Logic of Chance, chap. i. sect. 6. Male and female are not the 'ways in which the event may happen.' This would give the chance of each as $\frac{1}{2}$.

on the basis of a ratio observed *de facto* in a cycle of cases. The chances of white and black respectively are then $\frac{49}{50}$ and $\frac{1}{50}$ on the basis of this real but arbitrary cycle, regarded as the foundation of an ideal cycle of alternatives identical in content with itself.

Now the arbitrary cycle itself, the 30,000,000 individuals and 600,000 deaths, being given as real, there is no question of its correspondence with a pre-established ratio. If we ask whether the ratio of $\frac{1}{50}$ which it prescribes is realised in experience, we can only mean to enquire whether the distribution of the deaths is regular within the observed cycle, or whether the same ratio prevails outside this real cycle, which latter question may be followed up if we please by the same question as before about the regularity of occurrence. I am not quite sure that in speaking of the uniformity which attends large numbers of instances our writers always remember that such uniformity demands the comparison of two or more cycles. The ratio of results within a single group, even if embracing all hitherto observed instances, is in the absence of an antecedent rule a mere fact and not a realisation of anything. Every ratio is definite, and any two numbers have a ratio, so that it is a truism to speak of a definite ratio as prevailing between classes of cases in a single group[1]. Within a single large group if we speak of adherence to a ratio, we can only mean regularity of occurrence. And in the case of individuals that are not events in time the significance of such regularity and its existence must depend simply and solely on the order in which we consider and enumerate them.

Thus the two kinds of cycles or groups of instances seem to be quite differently situated with respect to empirical verification. i. A natural cycle from the first corresponds

[1] Logic of Chance, i. 6. The distinctive characteristic of probability is that occasional attributes as distinguished from permanent ones are found on extended examination to exist *in a certain definite proportion of the whole number of cases.* The italics are Mr. Venn's. How could they exist in anything but a definite proportion?

or does not correspond to its antecedent law, within the limits which that law spontaneously prescribes. *If* we throw all six sides of a die in every six throws there can be no doubt that up to the point when we break off the series is an empirical verification of the chances as we stated them. It shows that the unknown causes operate equally, and thus produce the result, which we anticipated by neglecting them. But in treating of actual experience we may practically disregard this kind of correspondence, which is not common in fact and at all events could hardly repeat itself through an extended number of observations.

ii. We are thus referred to the second question which we mentioned as capable of being proposed respecting a natural cycle, viz. whether the law which it presupposes (e.g. every side to turn up once in six throws of a die) is realised in the long run. It must be observed that to speak of realisation in the whole set of actual cases, whatever their number may be, cannot furnish a standard in this question, because this number is constantly varying and is very different in different subject-matters. There is nothing between realisation in every natural cycle and realisation in an infinite series if we keep clear of causal presumptions which do not belong to the reckoning of chances pure and simple. There is no doubt that the law presupposed by a natural cycle may be realised in a great and increasing number of observations, and that inferences may with the aid of causal presumptions be drawn from this realisation. But for all that, it is simply nonsense to speak as if the true and only true realisation of a ratio of chance was in the series of real instances continued *ad infinitum*. Mr. Venn, who is consistent in regarding this as the solution of the antithesis between equality of ground and inequality of reality, denies, as I understand him, that the formula $\frac{1}{6}$ [1] has any meaning

[1] Mr. Venn seems to have been influenced by considerations such as those of p. 360 above. It is true, as there shown, that the judgment which measures probability loses *ipso facto* that isolated reference to a particular alternative which marks the genuine, or at least the natural problematic judgment. In

as applied to a single real throw of a die, except by association with the idea of a series in which *all* sides should equally be exhibited. Here we come into the province of fiction. There is no reason, in the cases before us, that such a series should be a fact at all. And in these and in all other cases alike it is impossible that the infinite series could be a fact. And yet, if not a fact, it fails to solve the antithesis as a solution of which it is propounded. It is not in fact possible to go on trying for ever, and it is not in theory true that supposing we did go on trying for ever (abstracting from the contradiction involved) every alternative must be realised according to the ratio. The ratio may be justly erected according to our grounds of knowledge, even if some of the alternatives are absolutely impossible and therefore could never occur although, *per impossibile*, the series of trials should be prolonged to infinity.

In the case of the arbitrary cycle the answer to the question is still less favourable. The primary interest of the arbitrary cycle is just in that statement of chances affecting individual real cases which is suggested not to be the true meaning of the ratio. There is in this case no antecedent law between which and the real cycle a correspondence could be observed. The real cycle itself is and prescribes the law. And although cycles of real events that fall outside it, or minor cycles within it, can be tested and compared with it in respect of the ratios they display—as we compare the ratios of deaths to population in successive years—yet it is not easy to say on what ground the first cycle that we happen to observe should furnish a rule to which subsequent cycles are expected to conform. The whole group of

every statement of chance we have an apodeictic judgment involving the entire content of a disjunction in the bearings of its members upon one another (as condition and consequent). So far Mr. Venn and I are together. The question therefore reduces itself to that of the purport with which the reference to the remaining alternatives is charged, whether it depends on the idea of a completed series, or can be explained by the (assumed) equal claim which each alternative makes on reality in virtue of the (assumed) equality of their grounds. The latter view seems to me to be demanded by the nature of the abstraction on which the whole idea of stating chances depends.

observed events or individuals is a comprehensive fact, within which the ratio of the ways in which they happen or of their classes is also simply a fact. Any comparison which we may make of the ratio exhibited in minor cycles within this entire group has only the interest of the comparison between different groups of actual occurrences or individuals[1]. On the assumption that the operative but unknown causes are not changing progressively, or that we can allow for their progressive change, we may no doubt expect to find that a ratio which we elicited from case 1 to 1000 will hold good for cases 1001 to 2000. But if what we want is merely the serial form, we have it already in cases 1 to 1000; while if what we want is the multiplication of observations, why should the 2000 cases—a wholly arbitrary number—be especially satisfying? The fact is, that when we have the serial form given to begin with, as in these arbitrary cycles, or groups of instances limited only by our ceasing to enumerate them, we see that it omits just that peculiar transition which is the essence of the statement of chance. It only presents us with this transition in so far as, surrendering its serial form, it becomes the basis of a fractional expression which summarises our knowledge, drawn from the series, with reference to some instance or instances whether within or external to itself. This criticism applies to the serial form as such. The equal realisation of alternatives considered as equal (i.e. apart from regularity and irregularity, which are equality and inequality as judged by minor cycles) destroys the peculiar relation of equal knowledge to unequal fact, which is the ground of chance.

On the infinite series, or approximation in the long run, I can say no more than I have said above, and others have said before me. The thing is simply a fiction, and the

[1] Mr. Venn, Logic of Chance, ii. 8, seems thoroughly to accept this result, and to conceive that *all* probability, even in what I have called natural cycles (in his phrase '*a priori*' probability), is at bottom this and no more. I cannot but think that if probability in a specific case means anything, it must, even though dependent on an arbitrary cycle, be stated as above in the form of a natural cycle.

reference of the realisation of a ratio to it proves, if anything, that it is ultimately necessary to admit that chance is independent of a real series.

Causal Inference from Series.

β. The true bearing of a series on the verification or corroboration of a ratio expressing probability must consist in its relation to the causal presumptions which dominate our judgments about reality. All judgments that deal with fact assume, though they may not explicitly assert, causation. Statements of chance do not proceed by following causation into its ramifications; we should thus have concrete knowledge and not equality of alternatives. But when the results of experience coincide with the predictions of the calculus, this suggests to us *not* that we knew the right causes or any causes at all, but that the actual causes at work have a character compatible with the results which we obtained through the indifference of ignorance. If, on the other hand, the results of experience deviate widely, so far as experience goes, from the ratio suggested by the calculus, then *though this deviation can never amount to a flat contradiction*, yet it suggests an arrangement of causes incompatible with the results which were generated by the indifference of ignorance. If we cast six twenty times running with the same die, we have no right to say that this theoretically speaking contradicts the ratio of chance (unless we take as a standard, which no one would ever do, the natural cycle of six throws), for in 120 throws the balance might be restored. In other words, no sequence is impossible in such a case, nor is one more improbable than another, but of course any one sequence is immensely improbable beforehand as against the whole remaining mass of possible sequences. And in any marked or so to speak identifiable sequence this improbability strikes us as though it had occurred in face of some enormous probability in favour of some *one* other sequence, all the less identifiable sequences counting as if one in number, though $n-1$ in probability. This is a partial account of our surprise; but as has been well explained by Sigwart, there is in it the

further element that whereas the twenty consecutive sixes are on the assumptions from which we started but one among an enormous number of equal possibilities, they happen to be of such a nature that on another assumption, incompatible with those, they would follow with absolute or all but absolute certainty. We know that if the die is cogged it will always turn up the same side, or to speak generally, if there is present an operative cause which necessarily produces one alternative, that alternative will always be produced. This suggests the comparison between one ratio, that with which we started, which gives a very minute probability for the result found in practice; and another ratio, formed on a different assumption, which gives the observed result with something like certainty. Nothing binds us *absolutely* to either, but it is plain that *so far as experience has gone* the probability is with the latter in the proportion in which it gives the result observed with greater probability than does the former. It must be carefully remembered that here, as all through this discussion, we are dealing with hypothetical judgments only. The probability I speak of is only on the data taken into account. If I am playing with a most respectable friend who says he has got the die from a good shop, I may prefer to believe in the reality of a peculiar case rather than in a fraud.

Observed and calculated Series *may* coincide.

γ. I do not see that it is inevitable, as has been maintained, that an observed series *must* deviate from the calculated ratio, as it passes through fragments of a fresh cycle. Of course its coincidence with the ratio will not be demonstrable while any cases are wanting to finish the cycle; but if we shrink from saying that the observed numbers can coincide with the calculated numbers in a half cycle or less, we must not, I think, say that they deviate, unless coincidence at the next natural cycle is already impossible. Five complete cycles of sides and three different sides in thirty-three throws of a die surely form a case which should be distinguished from the same five cycles of sides plus three repetitions of the same side.

The series a reality for some purposes.

δ. In speaking of the truth of chances based on statistical averages, we may illustrate what has been said by the different positions of an insurance office and an individual customer of the office. To the individual whose expectation of life is in question the chance of life gives but little information, at all events so long as it is large. Whether he gains or loses by insuring his life is for him practically a mere uncertainty. He knows what it is reasonable to expect on the general data of reasoning, but he has no sort of ground for being surprised if it does not happen. For the office, on the other hand, so long as the averages are constant, the fate of individuals is wholly indifferent except in so far as they are more lightly or more heavily insured. If the office could be sure that in each class of customers (ranking them by the amount of their insurances) the average of deaths would be maintained at the same figure, it would make no sort of difference to it who in particular died. Thus it is true that in a real cycle the ratio of chance *may* in a certain sense become a fact. What is not true is that in becoming a fact it remains a chance[1], and that if it fails to be realised in the short run it must be realised in the long run.

Probability of judgment in the absence of knowledge.

vii. Before passing to the subject of modality I will mention an interesting point in the theory of chance, which is cognate to the above discussions on Privation, Affirmation, and Exclusion[2]. What statement of chances expresses the attitude which we ought to adopt towards an affirmation in the absence of all knowledge? The accepted answer appears to be $\frac{1}{2}$, 'for if we make it less than this we incline to believe it rather false than true,' or putting I suppose the same ground into mathematical language, 'If we grant that the probability may have any value between 0 and 1, and that every separate value is equally

[1] Cp. Adam Smith's attack on lotteries. You may see, he said, how much the chances are against you, by the fact that if you take all the tickets you are sure to lose.

[2] Chap. vii. supra. See Jevons' Principles of Science, p. 212.

likely, then n and $1-n$ are equally likely, and the average is always $\frac{1}{2}$.' I am not prepared to deny this conclusion, which of course follows from its data, but I think that it may be instructive to discuss these data, which appear to me somewhat superficial. It appears that the symbol $\frac{0}{0}$ has also been proposed, on the ground that 'the *a priori* [formal?] probability derived from absolute ignorance has no effect upon the force of a subsequently admitted [real?] probability[1].'

It cannot but strike the looker-on that these two suggested values $\frac{0}{0}$ and $\frac{1}{2}$ seem to correspond with the conceptions of non-impossibility and of real possibility respectively, and that to take probability as having the value $\frac{1}{2}$ in the absence of all knowledge is analogous to conjuring a positive favourable presumption out of an absence of counter-presumptions. The question is, according to the analysis of chance which has been stated above, whether the two alternatives 'true' and 'false' are *sole* and *equal* alternatives. Interpreting absence of knowledge as Jevons interprets it, to include entire ignorance of the meaning of an enunciation, I do not see that they are *sole* alternatives. 'If I ask the reader to assign the odds that a Platythliptic coefficient is positive, he would hardly see his way to doing so unless he regards them as equal[2].' But to a reader who does not know what the words mean—and this I suppose is what Jevons intended—there is no judgment conveyed. The alternative 'unmeaning' must then be allowed for in addition to 'true' and 'false.' This, it may be said, makes nonsense of the problem. The unmeaning is not a judgment, and the problem is only about judgments. Granted; but then I must not include the very large division of the unmeaning in the statement of chance without recognising it as a separate alternative. And if I am to exclude it altogether I must either be given a sentence which I am able to recognise as a judgment, or the problem must refer to any judgment as such without

[1] Bishop Terrot, quoted in Jevons, l. c.

[2] Jevons, l. c.

considering whether I know beforehand what it is. The latter case is not that in question, and could be treated perhaps better through statistics of error in the sciences, than by deduction from the alternatives 'true' and 'false.' It includes in the reckoning all judgments known to be true, whereas the present problem says nothing of these, but only of judgments on which being presented to me I am unable to return a verdict based upon positive grounds.

The real question then is this. Given a judgment which I can understand, but which I have no positive ground either to affirm or deny, what are the chances in favour of its truth and falsehood respectively? The conditions of this problem cannot of course be actually realised, because to understand the meaning of a judgment theoretically involves some consciousness of *pro's* and *con's*. Yet there are in the world so many almost arbitrary judgments, that the question has some importance. Truth and falsehood *are* in this case, the case of intelligible judgments, *sole* alternatives, but I cannot think that they are, under the supposed conditions, *equal* alternatives. I cannot think, that is, that every separate value of probability between 0 and 1 is equally likely. For the judgment being *a* form or indeed *the* form of knowledge, the hypothesis of ignorance, in this case 'absolute ignorance,' on which the statement of chances is erected, has a peculiar relation to the content of such a statement when that content is the judgment. If we knew there was a certain motion below a certain limit of velocity, but had no further clue to the velocity of the motion, it might be true I suppose that every degree of velocity below that limit was equally probable. But if we know that there is a judgment made, or proposed to be made, and have no clue to any degree of positive probability in its favour, then for us the zero of probability is the fact, and if we were to make the judgment in question it would in our mouth be false even if in reality true. Thus, on the basis of my individual knowledge, such a judgment *qua* judg-

ment is by the hypothesis *prima facie* false. But my knowledge is not all reality, and therefore I dare not say that falsity holds the field as an absolute certainty. The possibility however drawn from the mere difference between my knowledge and all reality, is an unmotived possibility; for there is at least no antecedent likelihood that my knowledge is always wrong. And I am not entitled to raise this unmotived possibility into an alternative having equal grounds with the *prima facie* falsity which follows from the hypothesis.

I am not prepared to suggest any way of representing these chances in numbers. Without equally grounded alternatives we cannot state chances, and I do not see where in this case these are to come from. If one read 'doctrines' for judgments, so as to restrict the question to matters of some depth and importance, one might obtain interesting enumerations out of the history of science bearing on such relations as those of false anticipations compared with true discoveries. But it would all amount to very little. I only desired to point out that the suggested symbols $\frac{0}{0}$ and $\frac{1}{2}$ seemed to lie in the track of the fallacy discussed above[1]. To say that objecting to a judgment we do not know to be true is as unreasonable as accepting a judgment we do not know to be true—and to say that truth and falsehood have a chance of $\frac{1}{2}$ each is to say this—appears to me to be a sophism in the vein of Sir Anthony Absolute[2]. If you have no reason for accepting a judgment, you must decline to accept it. If you only decline provisionally, and say that in future, or to the knowledge of wiser minds, the judgment in question may perhaps be proved true, then

[1] See chap. vii. p. 333.

[2] 'Absolute. "Sure, Sir, this is not very reasonable, to summon my affection for a lady I know nothing of."

'Sir Anth. "I am sure, Sir, 'tis more unreasonable in you to object to a lady you know nothing of."'

Sir Anthony wishes to represent the chances of attachment and non-attachment to any unknown lady as $\frac{1}{2}$ each, or even as more than $\frac{1}{2}$ in favour of attachment. This is really not a bad parallel to the view criticised in the text.

you unquestionably are cherishing some distinct though general presumption in favour of the judgment, and it is not one of those whose chances 'in the absence of knowledge' we are discussing. We do not treat really arbitrary suggestions with so much respect. It seems to me monstrous to say that half the equal grounds are for truth and half for falsehood when the fact is that you *have* no ground to think the thing true, and *require* none to think it false.

This brings me to one further distinction. The reader ought to reply, 'You do need a positive ground of denial in order to deny, and in stating the chances as $\frac{0}{0}$ you are denying, which *ex hypothesi* you have no right to do.' But I suppose that by the symbol $\frac{0}{0}$ we do not so much deny the judgment as refuse to state the chances. It is only the logical interpretation of this refusal that brings something like a denial into the matter. You cannot obtain a denial out of a pure privation, i. e. a mere profession of ignorance, but then in view of the positive mass and far-reaching presumptions of knowledge as a whole, no privation however *complete*[1] can be quite *pure*[1], i. e. quite free from positive grounds of denial. A complete and persistent privation must always, as I have tried to show above, verge upon an exclusion. But if we had at command a direct and positive ground of denial, then I imagine that we should not restrict ourselves to refusing to state the chances, i. e. to $\frac{0}{0}$, but should employ the symbol o. Or, in order to indicate that a case has no chances in its favour because all the possible chances are absorbed by another case which is certain and which excludes the former, we ought I should think to use the expression $\frac{0}{1}$, i. e. negation grounded in

[1] By a 'complete' privation I mean one in which we know absolutely nothing *in favour* of the matter of which we deny all knowledge, while I call a privation 'pure' in as far as we know nothing positive *against* the matter of which we deny all knowledge. And my suggestion is that, looking at knowledge as it really exists, wherever we have the former case it is almost impossible to have the latter.

positive certainty, which is the remainder of $\frac{1-1}{1}$ and so represents the total certainty available for the two cases as entirely absorbed by the one. Thus we should have three symbols representing ideas which we ought not to confuse, $\frac{0}{1}$ for demonstrable impossibility, $\frac{0}{0}$ for absolute ignorance (privation alike of real possibility and of impossibility), $\frac{1}{2}$ for a conflict of proofs, such that truth and falsehood are equally grounded alternatives, which in presence of absolute ignorance is not the case.

CHAPTER IX.

MODALITY.

Kant's view fundamentally just.

1. I PROPOSE to conclude the discussion of the judgment with a short treatment of Modality. For Modality, if it exists at all, is simply the degree in which individual judgments participate in the certainty of that permanent and all-embracing judgment by which the individual intelligence sustains those qualifications of the Real which for it constitute Reality. Our account of Modality must therefore resolve itself into a recapitulation of the principal types of judgment, having for its object to bring together in a single view certain of their characteristics which have already been noticed. The question before us is whether and in what sense there are degrees of logical certainty; not merely of habitual conviction, or of readiness to act on a belief, which are psychological and not logical, but of that characteristic which forms the differentia of judgment, and which may be described as *logical* assertiveness. This logical assertiveness itself indeed includes a psychical or psychological element which must be carefully distinguished from the purely logical or rational element of assertiveness.

One preliminary difficulty meets us on two sides. We find Kant[1] maintaining that modality affects only the copula in judgment, and that therefore, though a measure of assertiveness, it is indifferent to the content affirmed. And we find it maintained against Kant that modality has no reference to the copula in judgment, nor, consequently, to the assertiveness of assertion, but is a peculiarity of the

[1] Kant, Kritik der r. V. p. 97 (Hartenstein), 'Von der log. Function im Urtheilen.'

content affirmed which does not affect the essential act of affirmation[1]. Both of these views, it will be remarked, by separating the assertiveness of assertion from the content asserted, represent judgment as an arbitrary and irrational activity. It is not surprising that in the 'Grammar of Assent' ecclesiastical interest should have thrown itself zealously on the side of such a conception.

The view which I have attempted to explain in the present discussion is incompatible with both of the above-mentioned ideas. Every judgment, as we have seen, unites in it two elements of certainty; the formal or psychological element, which consists in a reference of its content in virtue of a perceived identity to the individual's personal world of perception and experience, and the material or logical element, which consists in the attachment of this content by rational necessity to the organised nature which the Real possesses as already qualified by the individual's knowledge. The former element corresponds to memory and the latter to reasoning. All reasoning is in the medium of memory, but memory as such does not involve reasoning. The two activities however are one in origin and in *ultimate* nature.

Now the psychological element of certainty does not vary. The unity of a content with the individual perceptive self admits of no degrees. If it appears to vary in degree, we are remembering *by* something, i. e. we are eking out memory by reasoning. Memory as such is dumb in presence of questions or comparison of grounds. It tells us nothing beyond the mere content which it recalls. But material or logical certainty depends on reasoning, and is

[1] Sigwart and Bradley certainly agree in this. Lotze seems to say it of the old Modality, in which 'It must be so counted as apodeictic,' but does not distinctly say it of Modality as understood by himself (and subsequently by the other moderns above mentioned), which requires hypothetical or disjunctive form for apodeictic judgment. In his suggestion as to Modality Lotze was of course anticipated by Hegel. Sigwart and Bradley deny the superior logical certainty of the apodeictic judgment, and Sigwart even disparages it on the ground of its mediate character. Here, at any rate, he commits a gross blunder.

therefore capable of more and less, and is the chief element of the assertiveness of judgments. It follows that modality *is*, as Kant said it was *not*, a characteristic of the content affirmed, but is also, for that very reason, as the moderns say it is *not*, a measure of the assertiveness of assertion. Whether modality must be said to affect the 'copula' at all, or the copula only, depends on what we mean by the copula. If the copula is formal and empty, an unexplained act of reference like that of memory, then modality does not affect it, or rather it does not affect modality. If, on the contrary, the copula is the act by which grounded necessity is recognised, then it is the essence of modality. The formal and indifferent copula of traditional logic *is* the psychological copula, and when treated as the logical copula becomes a logical copula indifferent to the logical content[1], which is absurd.

As a matter of organic principle, therefore, I shall follow Kant, although by what I must regard as a confusion, he refers modality to the form of judgment and not to the content, and although his 'problematic judgment' is rightly pronounced by later writers to be no judgment at all. His summary runs thus: 'Because, then, in this aspect [i. e. in modality] everything incorporates itself with the intelligence by degrees, so that one begins by judging problematically, and subsequently takes the matter to be true assertorically, and ultimately affirms it as inseparably united with the intelligence, i. e. as necessary and apodeictic, it follows that we may confer on the three functions of modality the further appellation of so many moments of thought as such[2].' Here as throughout philosophy it has

[1] Lotze does not fall into this trap. But he seems only to avoid it at the cost of separating off a particular fragment of content to be identified with the copula, at least when he is explaining the traditional view. But as against this the traditional view was right. The copula must have to do with all of the content or with none. In Lotze's own view of Apodeictic Judgment it has to do with all.

[2] Nearly equivalent to what I have often spoken of as non-impossibility. See below.

been the task of later writers to realise in the concrete a conception enunciated by Kant, but by him only half liberated from the formulae of obsolete conventions. Hegel's analysis of the hypothetical and disjunctive judgment, adopted by Lotze and subsequent writers, is the realisation of Kant's idea of modality as progressive incorporation with the understanding.

The Problematic Judgment.

2. In order to begin at the beginning we must start from Kant's 'problematic' judgment, which, *as he describes it*, is not a judgment at all. The problematic judgment according to him expresses mere logical possibility[1], not 'objective' possibility, and he gives as examples of it the antecedent and consequent in hypothetical judgments, or the isolated members of a disjunction.

Nature of Suggestion or Question.

i. But such elements of thought are of course by themselves not judgments, i.e. as Kant himself says, they are not assertory. It may be doubted however whether such elements of thought exist by themselves at all, and whether they do not of necessity enter into some judgments. Their nature is no doubt the same as that of the genuine[2] Question, which Sigwart has the merit of having discussed. I cannot think however that his psychological expressions help us to grasp the logical differentia of question or doubt. It is nothing to say that the idea merely floats[3] before the mind. It must, in order to rank as a definite doubt or

[1] Kritik der r. Vernunft, p. 97 (Hartenstein's ed.).

[2] The question which expresses a real doubt or ignorance; not one to which we know the answer, but ask in order to force the interlocutor to give it. This latter is an imperative, as Sigwart says (vol. i. 190–1). But then the former hardly perhaps has the differentia of the Question, which *is* just this imperative significance. So the 'genuine' Question is perhaps not a Question at all, but only a state of knowledge. *What* state of knowledge? Obviously one that presses for an advance, so probably a disjunction of ignorance. Kant's problematic judgment includes all supposition *qua* supposition, although known to be false or known to be true. But I do not think that Sigwart's complaint of a want of distinction between these cases and that of genuine doubt is well founded, because a supposition *qua* supposition is considered by an act of abstraction apart from the relations which constitute its falsity or certainty. Therefore, as subject to this abstraction, any supposition may rank as a doubtful judgment.

[3] 'In der Schwebe.'

question, make some specific claim, be a candidate for some definite place, in the permanent judgment of consciousness. There is a nearer approach to something intelligible in the suggestion that a problematic judgment is a judgment about oneself, saying that in the matter before us we are unable to judge. But this, though often true in fact, is an evasion of the theoretical difficulty. There must be some definite logical situation in virtue of which we say this. When we judge that a judgment is merely possible we must judge that its content has mere possibility. The reduction of judgment of possibility to possibility of judgment is an attempt to take refuge in psychology from a logical difficulty.

Although then the mere idea of a judgment, floating before the mind, is not, even if it exists, a judgment at all and therefore not a problematic judgment, yet every genuine question and every judgment made subject to a 'possibly' or 'perhaps' represents a peculiar logical situation, and not merely a psychological incompleteness of the act of judgment. It is not true as a rule that we begin with floating ideas and advance from them to judgments. I doubt if such a beginning is possible; it is certainly not normal. Our thought consists in the continuous modification of judgments—I had almost said, of a single judgment. The question, considered as a state of knowledge, is a disjunctive or hypothetical judgment used as the premise of an inference. A groundless question is as unreal as the 'infinite' judgment. I cannot ask 'Are you going home?' except on the basis 'You are possibly or probably going home,' which means when analysed either 'If x is the case you are going home,' or else 'Either you are going home, or x is the case.' The question does not mean 'I have a floating idea in my head of you as going home[1], and want to know if I am to refer this to reality.' It means rather, 'I judge true of reality a definite situation in which some

[1] The idea is not '*of* you as going home' but '*that* you may be going home;' i. e. something *is judged*, which may result in your going.

conditions of your going home are included; I want to qualify reality by this situation more precisely defined' or to qualify a further element of Reality, viz. yourself, by it. Thus Kant is not so far wrong in identifying a problematic judgment, or, as we may call it, a genuine question, with an isolated member of a complex enunciation; but it is only as a corollary from the complex thought or as an inability to make its outline precise, and not as a mere isolated member of it, that the problematic expression can be a judgment at all. For in its isolation, *ex hypothesi*, it is not referred to reality.

Problematic and Apodeictic Judgment.

ii. Possibility, then, as Mr. Bradley has told us, is a species of necessity, and it seems to follow from this that the problematic judgment is a form of the apodeictic judgment, and that any series of gradations in which the two have separate places—such gradations as Kant laid down—must be in contradiction with the nature of the case. If the judgment of possibility is the first form under which matters of knowledge attach themselves to the understanding, then it can hardly be a species of the final form, and ought to be verifiable in early thought.

We must begin by admitting the difficulty indicated by the last objection. All judgment, I have said, is in one respect assertory. It is probable that very early thought may present no other aspect. The distinction between memory and intelligence is a late distinction. The old man in Homer[1] who 'knows ten thousand things' cannot but remind us of the schoolboy whose friend 'knows an awful lot.' Whatever is in the mind, such expressions seem to suggest, ranks alike as knowledge. The *assevera-tion*, indeed, may be supposed to begin as soon as man feels the danger of deceit; and this form of speech recognises a distinction in degrees of certainty, and attempts to raise one matter of knowledge to the standard of another. But

[1] Homer is of course not primitive, but poetry is very conservative, and Homer is full of ideas which are derived from very early strata in the mind's formation.

on the whole, the distinction between memory and intelligence, and therefore that between mere reference to perceived reality and systematically grounded insight, would probably be found a vanishing distinction if we could examine the earliest phases of the human mind. Possibility, mere assertion, and necessity, as they exist for the civilised mind, are based upon differences that concern the material logical or systematic element in judgment. We have to remember however that logical facts exist long before the technical names for them, and we must not limit the existence of modalities by that of words like possibility and necessity, but only by that of speech-elements bearing the power of 'may,' 'must,' 'shall,' or 'would that.' And we must add that we cannot see how judgment should exist apart from all sense of rational necessity. A mere instinctive identification with reality, wholly without why or wherefore, is rather a theoretical limit below which judgment cannot be taken to exist, than an historical phase of the judging faculty.

The next difficulty is that possibility appears on the view taken above to be a species of necessity, and yet to be prior to necessity. In order to explain this we must refer back to the doctrine of opposition and conversion. Strictly and properly, a judgment can only be denied by another judgment of the same nature; a singular by a singular judgment, a generic by a generic, or a hypothetical by a hypothetical. But a very strong implication of denial can be conveyed by a judgment which being of a different type from that contradicted denies the right of this latter judgment to the type which it has assumed. If, however, the denial is to be prosecuted in earnest, the judgment of the lower type must be capable of maintaining itself on the level of that which it assails. Possibility, if not derivative or calculated, represents such a first effort at denial, directed against a necessary judgment, and may or may not go on to assume an explicitly necessary form.

a. Thus possibility as prior to necessity follows the

Particular Judgment. Exception and Instance.

meanings and development of the Modal Particular, which, owing to the continuity in the evolution of thought, on which we have so often insisted, has its roots far back in the quasi-singular or particular enumerative judgment. That is to say, the consciousness of possibility begins—I do not mean in every case, but in its most rudimentary logical form—with a rule and an exception or with a positive instance suggesting a rule. And it passes into a further type with the essentially negative, or again with the essentially positive *modal* particular. The latter, indeed, the positive modal particular, is hardly intelligible apart from the explicit recognition of necessity. But in accordance with a principle to which we shall have to recur it is quite customary for thought to employ a derivative and secondary judgment which is dependent upon a primary principle remembered as a rule. Many judgments of possibility—those current in systematic thought—are after this fashion corollaries from judgments of neccesity, or rather from the fact that certain judgments of necessity are accepted as true. I now proceed to illustrate the development just described.

Possibility is at first negative. Bare negation indeed is nothing, but possibility in its simplest case comes very near bare negation. Such a possibility when veiled under the equivocal form of the particular judgment rests on an *exception*. We must not suppose that the possibility is positive because the exception is a positive case. The content of a mere exception as related to the rule which it impeaches is purely negative, i.e. only contradicts, and suggests no contrary principle. Suppose we have a half-collective and half-generic judgment like 'All English railways are well managed.' Suppose that then we come upon an English railway which is not well managed, and embody our observation in the judgment 'There is an English railway which is not well managed.' This may readily be interpreted as a judgment of negative possibility, amounting to no more than this, 'It is not true that

English railways are in every case well managed,' or in other words, 'It is not impossible for an English railway to be other than well managed.' The principle is just the same if the rule is negative, e.g. 'No crows are white.' An exception would contradict this, but only by establishing little more than mere possibility (not-impossibility) that a crow may be white. 'There is a case in which a crow is white;' 'It is not true that no crows are white.'

The *instance* makes the step from negative to positive possibility. Like the exception, it implies a generalisation, at least incipient, but it supports this generalisation instead of contradicting it. Supposing, what is always ultimately the case, that the *exception* is a latent *instance*, the judgment which expresses the exception will change, in coming to express an instance, from a mere contradictory to a contrary which is also contradictory. Let the original rule be 'No secular education can be spiritual' and the exception be 'In the case of literary education we have a secular education which is spiritual,' with the negative result 'It is not true that no secular education can be spiritual.' Then when we go on to treat the exception as an instance[1] we get a result hardly differing from the former in words, but charged with the material distinction that we now see reason to think that 'secular education as such may also be spiritual,' i.e. It is possible that—or 'There is real ground for supposing that secular education, etc. etc.'

Negative and Positive Possibility.

β. When we advance to the modal particular we have the same distinction in a purer form. The modal particular has been treated above as the converse by limitation[2] of a hypothetical judgment, and at all events may always be

[1] Exception presupposes rule, and rule presupposes positive instance, it may be said, so that our idea of negative possibility coming first gets us into a circle. The fact alleged is true; a positive rule must come from somewhere, and probably from a positive instance. But prior to the idea of denying the rule the generalisation is direct or naïve, and does not pass through the stages of modality except on the embryo scale on which it also implies negation.

If the hypothetical judgment has a negative consequent, it is of course needless to limit it in converting.

treated as the contradictory of another hypothetical judgment. 'If A is B it is C' becomes when converted by limitation 'If A is C it may be B,' which latter is *at least* the contradictory of 'If A is C it is not B.' Where the modal particular really originates by the conversion of a hypothetical judgment, it is of course an inference or corollary from a principle with reference to another and opposite principle. But as usual the actual or historical modes of initiation of the judgment are one thing, and its logical essence another. Obviously the modal particular may be generated either by inference from explicit principles, or by the suggestion of rules through instances.

In any case the judgments 'A may possibly be B' and 'A may possibly not be B' have two degrees of meaning analogous to those of the exception and the instance. They may be *mere* contradictories of the hypothetical judgment to which they are respectively opposed, or they may be contradictories growing into contraries. If they are *mere* contradictories, corresponding to *exceptions*, then the judgment 'A may be B' merely means to overthrow the principle that 'A cannot be B'; that is to say it asserts that if or though A is, yet it does not follow, from that, that B is not. It is easy to give the corresponding significance to 'A may not be B.' But precisely the same judgments 'A may be B' and 'A may not be B' are capable of corresponding to the *instance*, and their meaning then is that there is some positive connection between an unspecified condition x, which is fairly conceivable of A, and B or the negation of B as may happen. Under these circumstances, even though we do not know that Ax itself is actually found in experience, yet we have ground for saying that there is a rational connection or antagonism between A and B. Many degrees of these connections are to be met with. If x were the entire ground of B, and we knew x to be true of A, then we should no longer have possibility but certainty. But if x is part of the ground of B, and we know x to be true of A, then we have a degree of real possibility

varying with the relation of x to B. Or again, if x is not the ground but a consequent of B, and we know categorically that A is x, we have in effect an inference, from the hypothetical 'If A is B it is x' converted by limitation into 'If A is x it may be B.' I will give a concrete example.

Plants (A) may possibly possess sentience (B). Taken as the mere guess of an unscientific mind—prepared to say the same no less of stones and metals, air or water—such a judgment would represent a mere negative possibility, or in other words, it would express no more than the fact that having considered the universal judgment 'Plants are not sentient' the individual mind happens to see in it no sequence of reason and consequent and therefore pronounces that 'There is no ground for asserting that plants are not sentient.'

But the same judgment 'Plants (A) may possibly have sentience (B)' is capable of conveying a more positive meaning. It may rest on the conviction that 'If plants (A) have irritability (x) they must have sentience (B).' Assuming ignorance as to actual observations of irritability in plants we nevertheless have then a certain congruity [1] to go upon in saying that A may, in a sense that has a certain basis of reality, be B. But still more strongly, if we could say 'If Plants (A) have sentience (B) they must have irritability (x),' *being able to supplement this with the fact* 'There are plants (A) which have irritability (x),' we should be able to affirm 'There are positive grounds for maintaining that plants A have sentience B.'

Possibility may therefore mean (i) the inability to make a certain hypothetical judgment, so long as we bear in mind that *mere* privation or inability is a limit which the judgment must not *actually* reach if it is to retain signi-

[1] We should not e.g. attach any such weight to the judgment that if a plant had poetic genius it must have sentience. I claim throughout that congruity is essential and not accidental in supposition. If we go outside the system of fact which is our basis of supposal, we get results analogous to the 'infinite judgment.'

ficance. This possibility is non-impossibility. Or it may mean (ii) the inference from a hypothetical judgment, whether explicit or suggested in instances, which (*a*) assigns an intelligible condition (or makes us believe that there is such a condition), which would if *real* establish the consequent whose possibility, assuming the reality of the subject of judgment, is in question, or (*b*) assigns a certain logical consequent to the attribute or event in question considered as a logical antecedent, which consequent is known to be real. This logical consequent may be either an effect with alternative causes, or a consequent with alternative reasons. The ideal or reciprocal form of the hypothetical judgment excludes mere possibility and therefore does not concern us here.

Essence of the Problematic Judgment.

γ. It is plain from the above examples that the terms 'possible,' 'probable,' 'may,' 'might,' and 'must,' stand for *more or less reflective estimates of certain kinds of knowledge.* The essence of the problematic judgment is the substitution of such an estimate for the concrete steps of inference really involved in an affirmation. Possibility results in referring to reality, *without transition*, but *subject to an estimate*, what is only connected with it by transitions. When the whole transition is made explicit, the allegation of possibility is superseded [1]. The judgment which has all its conditions and reservations fully assigned to it is of the apodeictic order; possibility arises from effecting the reference to reality apart from the conditions. The idea of 'possibility' is our substitute for the omitted conditions. Obviously such an idea may emanate from all degrees of confused perception or of reflection. We may be silent about the conditions either because we cannot clearly grasp them, or because we are explicitly abstracting from them. But an estimated indirectness of transition there must be if we are to judge problematically. Disjunction can be treated in the same way, owing to the hypothetical interrelations of its members, and thus the statement of chances

[1] Cp. p. 360, supra.

is a clear and extreme case of the estimate in question. Its essence is to burden the reference to reality of one alternative with a hindrance drawn from the number of other alternatives. All possibility indicates a similar tendency. But the statement of chances has measured its own cloudiness and made certain of its own uncertainty [1]. It is therefore no longer problematical. It supplies a definite predication of a hindrance to reality, and not a hindrance to predication.

Thus the true problematic judgment is a judgment with a peculiar and reflective content, which interferes with its assertiveness. It is a hypothetical or disjunctive judgment *in disguise*. All judgment whatever is within a real system, but the problematic judgment has its relations to its real system peculiarly obscured or neglected. In the question, for instance, we only make explicit a part of the intellectual state, ultimately affirmative, on which our desire for further knowledge depends. A question indeed often vanishes when we insist on its being clearly put.

Assertory Judgment.

3. The other forms of modality may be briefly dismissed. Every judgment may be called assertory, as we saw, in virtue of its psychological reference to self-feeling. If any judgments are to be called assertory in a strictly logical and material sense, they must of course be the singular judgments which depend on union of attributes within the concrete subject of the judgment, and not on their necessary connection in a larger subject falling outside the judgment. Such judgments are even *logically* assertory in as far as the concrete subject is merely individual as a synthesis of differences not connected by abstract necessity. So far on the other hand as it displays individual *character* and lends itself to analogical affirmation, it stands for the present purpose on the

[1] This is the reason why the 'Thermometer of Probability' (see De Morgan, Budget of Paradoxes, p. 416) would not be of very general application. What it measures is the ratio of the whole number of equal alternatives arising on a certain condition to the number of desired alternatives so arising. But in concrete knowledge we have no security of finding equal alternatives.

same footing with the subjects of necessary and apodeictic judgments. The assertory judgment has a higher degree of assertiveness than the problematical judgment as such, because its reference to reality though not apodeictic is direct and open. It would be impossible to maintain Kant's view of a progressive incorporation of contents with the understanding, if he meant that every trivial judgment, say, of perception, was preceded by a recognition and estimate of uncertainty. But all experience supports his contention that imperfect judgments in which only one element is clear, *and in which this clear element is attached to reality through others which are not clear*, belong to a less complete phase of knowledge than judgments in which the reference is clear and complete. If the problematic judgment arises by intentional abstraction from precise knowledge, this makes no difference. We are returning on purpose to an imperfect form of judgment from a more perfect one, in order to exhibit a net result which the more explicit form will not display. We must stand by the result which we thus obtain. We cannot eat our cake and have it.

Of course where an instance indicates a possibility, the assertory affirmation of the instance and the problematic affirmation of the possibility do not refer to the same content. 'This Drosera shows irritability' is a singular judgment of perception. The problematic judgment 'There are conditions though unknown in detail under which the nature of a plant develops irritability,' i. e. 'A plant as such may have irritability' arises from the analysis of the above instance into a general suggestion. Such an analysis is probably concurrent with the perception of individual identity on which the Singular judgment rests, but the two are not identical. Imperfect insight into necessary connection may affect the same content which is being erected into a thing, but is not one with this process of erection. Assertory assertion and problematic assertion may be and must be conjoined in every problematic judgment, but they

refer to different elements in the content affirmed, the former to the system as a concrete real whole, the latter to some element of the system as related by abstraction to the other elements. When the latter aspect of the judgment is dropped or superseded we have the assertory affirmation pure and simple. The assertory judgment has no degrees of assertiveness except in so far as in virtue of its specific content the problematic or apodeictic judgments inevitably show themselves within it.

The Apodeictic Judgment.

4. Judgments of apodeictic character, i. e. hypothetical and disjunctive judgments, lay claim in virtue of their form to a higher degree of assertiveness than either problematic or assertory judgments. The reason of this is that their form has for its differentia the exact exposition of the transitions, conditions, or alternatives subject to which the judgment is true of reality. By such exact exposition the content either becomes an articulated system, or at least reveals itself as fitted to take a place in such a system. The former is the ideal of the disjunctive, the latter that of the hypothetical judgment. Reality considered as absolutely known is of course *ex hypothesi* taken to be absolutely asserted. But Reality is not by any sane person considered to be absolutely, i. e. completely and precisely known. Degrees of certainty in apodeictic affirmation arise from the consciousness—a logical consciousness made explicit in the structure of judgments—that the individual's knowledge is but imperfectly identified with the ideal judgment which would qualify Reality by the complete content of Reality.

The Hypothetical Judgment.

i. In the hypothetical judgment, as we have seen, though important elements are made explicit, yet the connection which is affirmed implies an underlying reality which is not expressed in the content of the judgment. Therefore the hypothetical judgment is subject to two elements of uncertainty, viz. its own reference to the limited reality the affirmation of which it implies, a reference which may be partial or confused, and further the relation of that affirmed

real system to the content of Reality as a whole. 'The British Parliament is able to alter a statute affecting its own duration.' This is rather a generic than a hypothetical judgment; but for the present purpose these two types must rank as very closely akin. About such a judgment there is first the question whether it really follows, or how necessarily it follows, from the facts which we are prepared to affirm of the reality known as the British Constitution, and secondly, what opening these facts themselves, as compared with the greater reality of our entire experience on the ground of which *they* in turn are affirmed, leave for error or for unseen modification. Any disjunctive judgment, as compared[1] with a given hypothetical judgment of which it may be regarded as a development, makes this underlying real system explicit, and therefore has no source of uncertainty but that of a failure in the necessity by which this system itself is attached to Reality as a whole. But of course the disjunctions which we commonly use are for the most part systems within known systems, and therefore stand on the same logical level of certainty with hypothetical judgments. Such e.g. is the disjunction which expresses the number and nature of the conic section, resting as it does on the ultimate real system which we take to be the nature of space. Only disjunctions that embody a complete and coherent sphere of knowledge, such e.g. as the nature of space, have the character which has just been ascribed to the ideal disjunction. But even with such a disjunction we still have the difficulty in the background, 'Does the real system which we affirm'—in this example the nature of space—'*really* emanate as a

[1] It is absolutely necessary when we attempt to compare judgment forms in respect of their essential import, to select instances which belong to one and the same progression. A hypothetical judgment drawn from an advanced phase of science has at once more content and more precision that a disjunctive judgment drawn from everyday experience. To judge the capacities of the two forms by instances so selected would be like judging the powers of civilisation and savagery by comparing a civilised infant without allowance for age to an adult savage.

necessity of knowledge from the whole reality which is forced upon us by experience?' It appears to me to be quite idle to maintain that all judgments, or even that all necessary or apodeictic judgments, are on a level in this respect. Ultimately, we may imagine, nothing can be rightly known without knowing all else rightly, so that every isolated fact and principle of knowledge would be implied in, say, the existence of morality or in the existence of an intellectual world. But as knowledge is in fact constituted its parts are fragmentary and incoherent, and there is much that we affirm upon only a partial or limited necessity, while much again is so incorporated with the whole fabric of our real world that we feel bound to maintain the former if we would not fall into hopeless contradiction with the latter [1]. The assertiveness of affirmation is not indeed measurable outside the calculus, but it is capable of being perceived and to some extent compared. It is not a mere feeling, but an insight into connections. It is absurd to maintain that in affirming the whereabouts of a friend, or the harmonious or other effect of a combination of colours, or the continuity or non-continuity of matter or of space, I am pledging my intellectual existence to the same degree as when I affirm the relations of the multiplication table, or (subject to the requisite interpretations) the law of causation, or the existence of moral purposes.

The uncertainty which may attach to apodeictic judgments arises then from the same cause as the uncertainty of problematic judgments, but the cause is operative in a different mode and in a slighter degree. We always *feel* certain when we judge, for all judgments involve the same psychological identification with self-feeling. But we *know* that this certainty is conditional on our expressing Reality

[1] This must be read subject to reservation as regards the actual language in which abstract principles are expressed. It is a recognisable function of the body of knowledge, not a limited set of stereotyped ideas, which we may be justified in holding indispensably necessary to our reason. See below, Bk. II. chap. vii.

with precision and completeness, and this we are well aware that we never do. Of course, to begin with, the apodeictic form of judgment is no guarantee, any more than any other, against falsehood or frivolity. There may be no underlying real system at all, or that which is taken to be referred to may in no way justify the sequence erected on it. Any false generalisation is an instance of this. Or again, the necessary transition may be quite incompletely set forth, so that the judgment sinks *ipso facto* into a problematic judgment in spite of its apodeictic form. Such are judgments in which a remote cause or consequence taken as a sign is substituted for the ground of the sequence, so that the judgment though not untrue in fact has the appearance of a riddle. 'If the stick will beat the dog the old woman will get home to-night.' Here we have no indication of the real arrangement on which the sequence rests, and the condition, so far as can be seen without copious supplementation from ulterior knowledge, is irrelevant and equivalent to an unknown condition, implying as it does a number of unknown conditions. This is the explanation of the examples to which Sigwart appeals as showing that apodeictic judgments are not in fact made with any peculiar certainty of conviction. 'There is a common idea that the apodeictic judgment stands for something higher than the assertorical. It is believed that if we start from the problematic judgment and ascend to the apodeictic we steadily increase the certainty of our knowledge, and add to the worth and dignity of our assertions. This idea must be relinquished. All mediate certainty must stand in the end on immediate knowledge; the ultimate premises of every proof cannot be proved. The usages of life stand in comic discrepancy with the emphasis we lay upon apodeictic certainty. The sayings "It must be so," "It must have so happened" are judgments apodeictic; but the confidence they express has most modest limits[1].'

This is not the place to criticise the fundamental view

[1] Sigwart, Logik, i. 195, quoted in Bradley's Principles of Logic, p. 186.

which Sigwart here expresses, but to which he is, happily, not faithful throughout. In treating explicitly of the nature and bases of inference we shall see that the distinction between mediate and immediate knowledge coincides with the distinction between what is known and what is only on the way to be known. If Sigwart meant what he said in this place, he would have cut himself off from all possibility of believing in science. As to the examples which he adduces, they fall into their place, according to what has been said, as problematic judgments. 'It must have so happened' is an inference from reality under a condition, to reality without an expressed condition, and therefore is problematic.

The degrees of certainty belonging to the apodeictic judgment itself are as we saw of the same kind as those which characterise the problematic judgment. The whole of the reality on which the sequence is intended to be based may not have been brought to bear upon the sequence, and even if it has, its own relation to the reality which is the ideal of knowledge may be so disproportionately trifling as to make the judgment an especially inadequate embodiment of the ideal Reality which alone is certain.

I may illustrate this conception by our present knowledge of Hypnotic and kindred phenomena [1]. The curative action of Hypnotism, or the beneficent anaesthesia which may be produced in some forms of the Hypnotic state, are now as it seems matters capable of embodiment in empirical generalisations. These rules or laws can be exhibited, like all rules or laws, in hypothetical or disjunctive form; that is to say, as consequents following upon conditions, or as alternatives arising within a certain identical content. On a certain degree and kind of hypnotic trance a certain

[1] I believe myself justified, when writing for purely logical purposes, in treating the actual phenomena known to science as freely as may be necessary to give them sharp outlines, and to avoid a mass of reservations and qualifications that would be only an encumbrance for my present purpose. I on my side hope to keep clear of wilful distortion, but the reader on his side must not accept my illustrations as citations from a biological text-book.

anaesthesia is consequent. A hypnotised subject is capable of some three or four recognisable alternative states. In certain forms of nervous derangement acquired, *or, as it seems, congenital*, repeated hypnotic treatment exercises a sanative influence.

Now although I personally entertain no doubt that there is, as the phrase goes, 'something in' all these conceptions, and though I am prepared to affirm them, i.e. to judge them true of reality, as embodiments of an experienced content which must be affirmed somehow and which I cannot affirm otherwise, yet so far as I understand myself I do not stake my intellectual existence upon them as I do on the existence of causation, or morality, or beauty. On what I *mean to say* in them, on the experienced content from which they are drawn, I do stake my intellectual existence; but this content, apart from my explicit judgment, is to me an x, a thing-in-itself, a nothing. I must stand or fall by my judgment as it is, not merely by my ultimate intention to embody reality, which is the common and formal feature of all affirmation. And I know perfectly well that by my explicit judgment on such matters as these I am very likely to fall. The reason of this is not that the cases on which I rely are few in number, compared, e.g. with ordinary cases of the operation of digitalis on the heart or of mercury on the liver. One case is enough, as we all know, where the framework of knowledge stands ready to receive it with the grip of necessity. The reason is rather that the organised system of reality within which the sequences in question have their force, lies or has hitherto lain outside the great fabric even of biological science, not to speak either of deductive reasoning on the one hand or of philosophical construction on the other. been as a whole identifiable either with the principles of The principles of abnormal psychical phenomena have not physical causation or with those of normal psychical development. The judgment is therefore obstructed by the want of contact or necessary relation between the system of

such abnormal phenomena, which it must in some way refer to reality, and the entire *cosmos* of normal evolution. Supposing, however (I speak merely by way of illustration), that the abnormal states in question, even those which present the apparent puzzle of a morbid origin combined with a curative effect, could be exhibited as cases under the known principles of evolution, the whole ground and certainty of the judgments relating to them would be put upon a new foundation. It is an old idea[1] that many states and susceptibilities of the soul, which are commonly treated as mere freaks of nature or capricious results of disease, may really have their place among the phenomena of evolution no less than sleep and waking, or the oneness, expressing itself through heredity, of parent and child. If peculiar forms of sensitiveness and peculiar 'morbid' states or transitions to states could be brought under such heads as survival, reversion, or analogous development, their underlying reality would be grafted on the main stem of the organised real world, and the necessity with which they were affirmed would become more determinate and more concrete.

The Disjunctive Judgment.

ii. Disjunction by its form aims at the standard of a complete and therefore of a real system. 'Real' because it points to nothing beyond itself as an implied ground of truth. We have seen sufficiently above that no objection can be raised against the reality of the content of any judgment by reason of its being extended in space or time. No judgment confines its reference within an atomic 'now,' and no reality can display itself as existent within an atomic now. It is grammatically possible however for a disjunctive proposition to express a judgment which is hypothetically disjunctive: 'A man who would act so must be a knave or a fool.' This shares the character of all hypothetical judgments in implying an unexpressed real system as the basis of its truth, and its certainty must be judged as the certainty of a hypothetical judgment. But

[1] See Hegel, Encyclopädie (Anthropologie), sect. 404.

the disjunction according to the ideal prescribed by its form is in itself an exposition of the reality that determines its parts, and therefore is not a sequence within a presupposed system, but is itself the content of a real system. It therefore properly ranks with the generic judgment, to which it is affiliated, as quasi-categorical; and has only the imperfection of certainty which arises from the comparatively minute range of reality that is comprehended in any such simple system.

It is obvious from what has been said above that the degrees of certainty here discussed are not numerically estimable, because they are not reducible to ratios of equal alternatives. It may therefore be justifiably complained that the phrase 'degree of certainty' is misplaced, and should be transformed into 'stage of logical necessity.' I have no objection to some such transformation provided that it is distinctly understood that modality affects the assertiveness of assertion, that this assertiveness is a matter of content and not of the formal copula or reference to self-feeling, but that if we extend the notion of the copula to include the material or logical grasp by which a complex content is fitted on to a complex Reality then we may say that Modality is a matter of the Copula. In any case, the progressive incorporation of a content with the understanding [1], that is, with the organised ideal system by which the understanding permanently qualifies the Real, is the same thing as the progressive participation of that content in the certainty that could only be complete in a judgment that should exhaust Reality.

[1] Cp. Whewell's account (see Mill's Logic, i. p. 279) of coming to perceive the necessity of a principle which he had before accepted as fact. This is merely the acquisition of a precise and coherent insight into its dependence on reality. Cp. Book II. chap. vii.

END OF VOL. I.

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